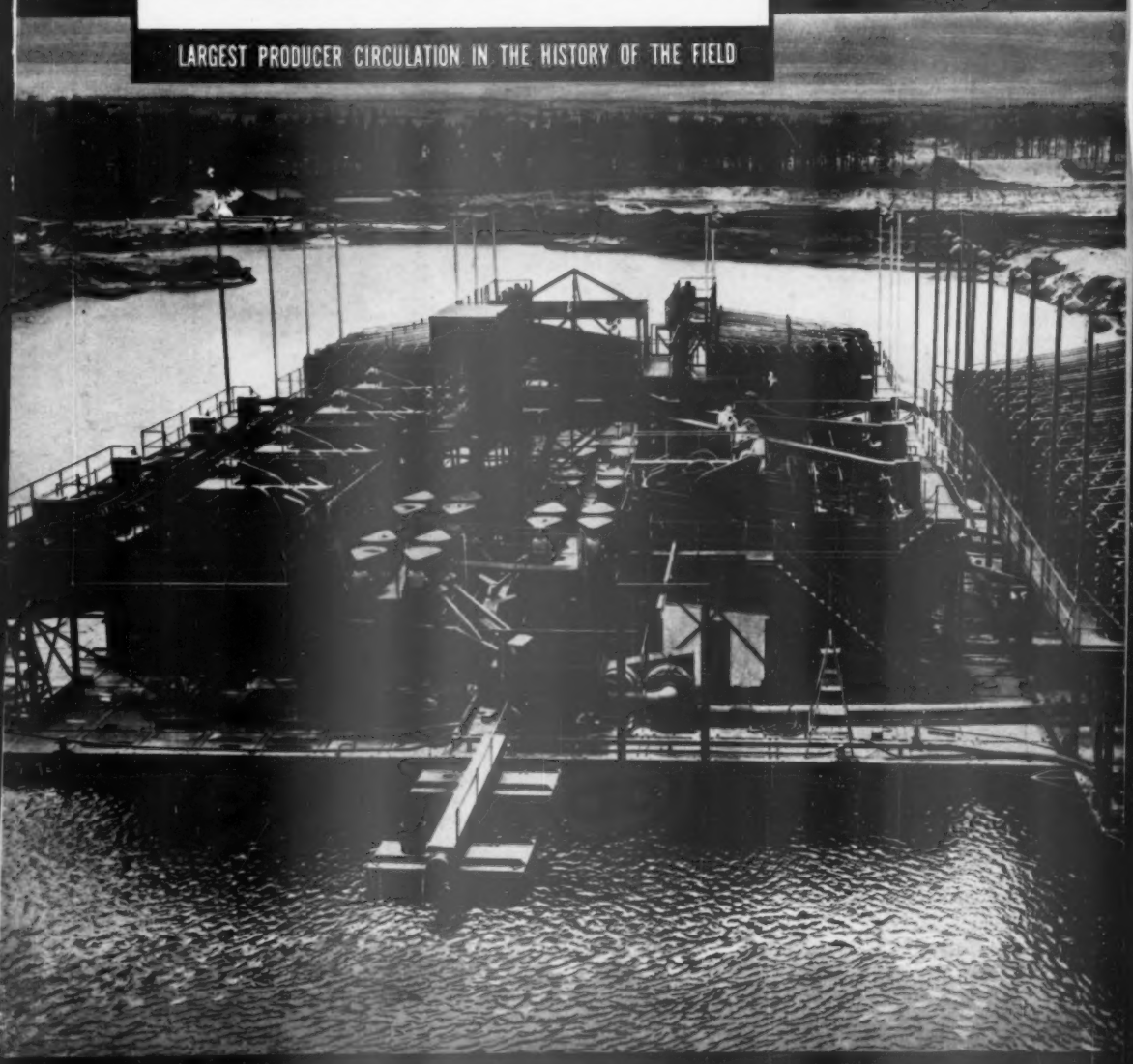
THE INDUSTRY'S RECOGNIZED AUTHORITY

ROCK PRODUCTS

LARGEST PRODUCER CIRCULATION IN THE HISTORY OF THE FIELD







triple play for profit

with P&H ELECTRIC SHOVELS



All three of these P&H Electric Shovels are at work for J. Robert Bazely at Pottsville, Pa. There are three sizes at work here — 4, 5 and 6 cu. yds., all delivering steadily at rock bottom costs.

P&H leads the field in Electric Shovel Developments.

It's the same pattern wherever these new P&H Electric Shovels go to work: The first machine sells the second — the third — and more.

The reasons are plain and simple — *better performance — bigger production — lower tonnage cost.*

Reasons behind the reasons are such advantages as P&H Magnetorque* which powers hoisting motions electro-magnetically — smoother, faster, more dependably . . . rugged all-welded construction with more strength to withstand shock loads . . . independent propel for quicker move-ups . . . stepless control which eliminates all contactor troubles . . . filtered air cab ventilation for less electrical down time.

The cold, hard facts that count are: *performance, production, low tonnage cost.* Figure your costs with P&H Electric Shovels and you'll find a convincing difference. It explains why every third P&H Electric Shovel sold is a repeat order.

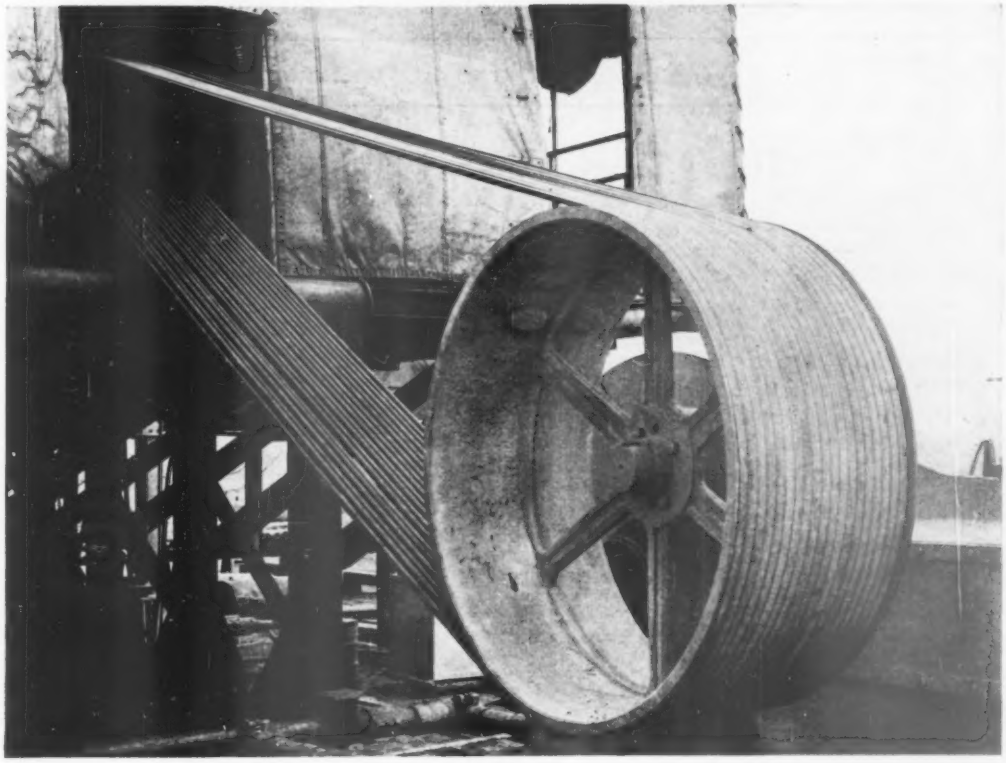
*T. M. of Harnischfeger Corporation for electro-magnetic type clutch.

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HARNISCHFEGER CORPORATION

Every third P&H Electric Shovel sold is a repeat order

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Here B. F. Goodrich grommet belts are saving $104.50 a month

B. F. Goodrich grommet V belts cut costs 20 to 50%

THESE 18 V belts are needed to drive heavy pumps for drilling oil wells. The belts have to operate 24 hours a day, 7 days a week, in all sorts of weather. Ordinary belts couldn't stand the heavy pulling load, couldn't take the strain of round-the-clock operation. They averaged 9 months' life in this kind of service.

Then B. F. Goodrich grommet belts were tried. After 19 months, and drilling wells totaling 76,000 feet deep, these grommet belts look as good today as the day they were installed. Here's why B. F. Goodrich grommet belts can be counted on to save on belt costs:

No cord ends — A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends. Because most of the failures in ordinary V belts occur in the region where cords overlap, the endless cord section in a grommet V belt eliminates such failures.

Concentrated cord strength — All of the cord material in a B. F. Goodrich grommet multiple-V belt is *concentrated* in twin grommets, positioned close to the driving faces of the pulley. No layers of cords to rub against one another and generate heat; cord and adhesion failures are reduced.

Better grip, less slip — Because a grommet is endless, a grommet V belt is more flexible, grips the pulleys better. Size for size, grommet multiple-V belts will give ⅓ more gripping power, pull heavier loads with a higher safety factor.

Only B. F. Goodrich has the grommet!—No other multiple-V belt is a grommet V belt (U. S. Patent No. 2,233,294). Now available in C, D and E sections. See your local B. F. Goodrich distributor. *The B. F. Goodrich Company, Industrial & General Products Division, Akron, Ohio.*

Grommet V Belts BY

B.F.Goodrich

RUBBER FOR INDUSTRY

DECEMBER, 1951

ROCK PRODUCTS

THE INDUSTRY'S RECOGNIZED AUTHORITY

VOL. 54, No. 12

Bror Nordberg
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Editorial Consultant

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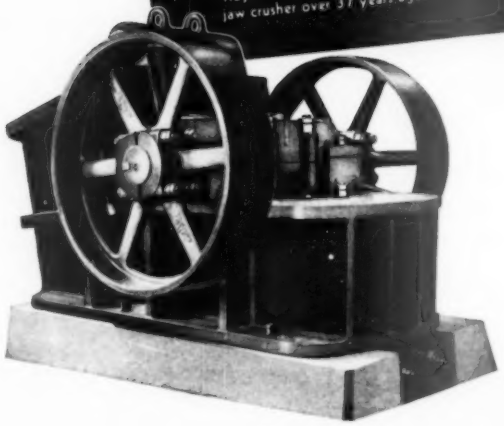
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3. A big 60" Gyratory in the plant of a leading English Limestone producer.
4. 3—54" Traylor Gyratories in Canadian Cement plants.
5. A 54" Gyratory operated by a large Canadian Nickel producer.
6. A 54" Traylor Gyratory in a Mexican Copper plant.
7. A 54" Gyratory in an English Cement plant.
8. A 48" Traylor Gyratory in the Northwest.
9. A 48" Gyratory operated by a large Eastern Mining company.
10. A 48" Gyratory operating in a large Eastern Trap Rock plant.

JAW CRUSHERS

11. 2—48" x 60" Traylor Jaw Crushers in the plant of a leading Canadian Asbestos producer.
12. 7—48" x 66" Jaw Crushers in the Canadian plant of a well known Nickel producer.
13. A 56" x 72" Traylor Jaw Crusher can be seen in Newfoundland.
14. A 54" x 84" Jaw Crusher in large Iron Ore development in Venezuela.
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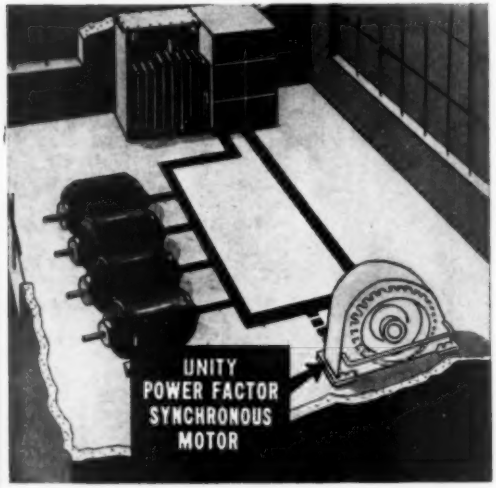
A "Traylor" leads to greater profits

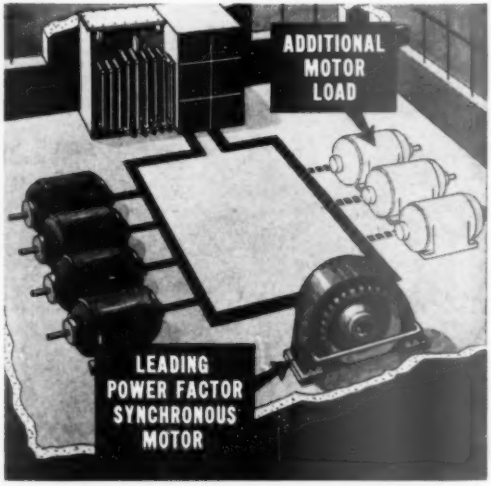
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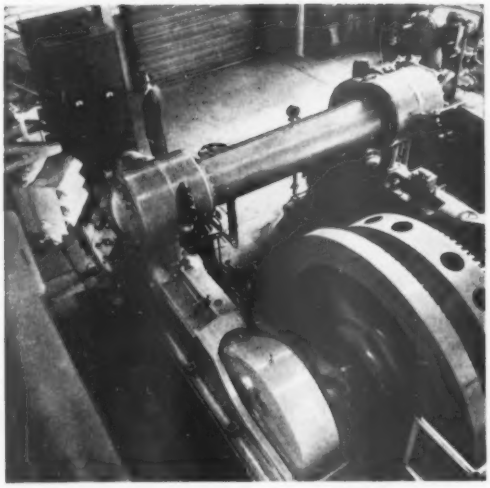


1. Fundamentals of Motors
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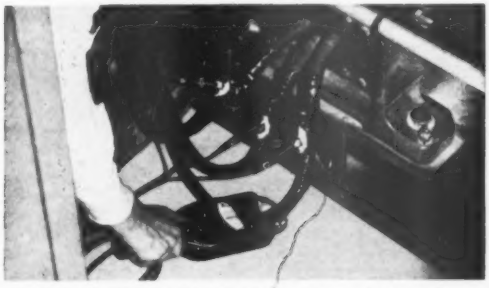


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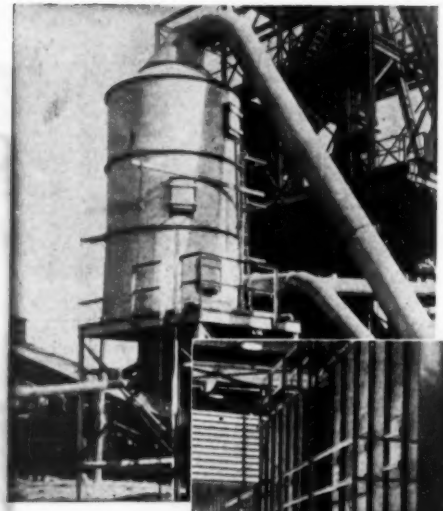
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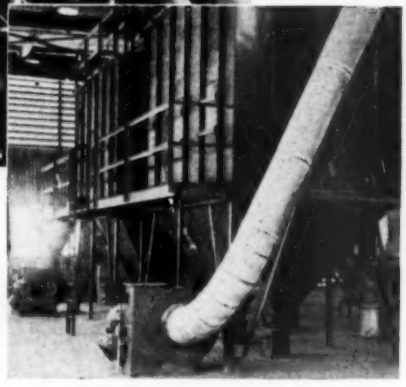
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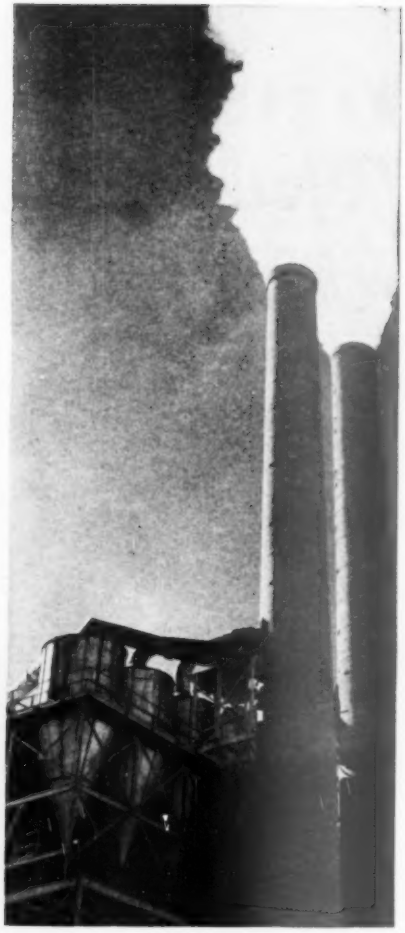
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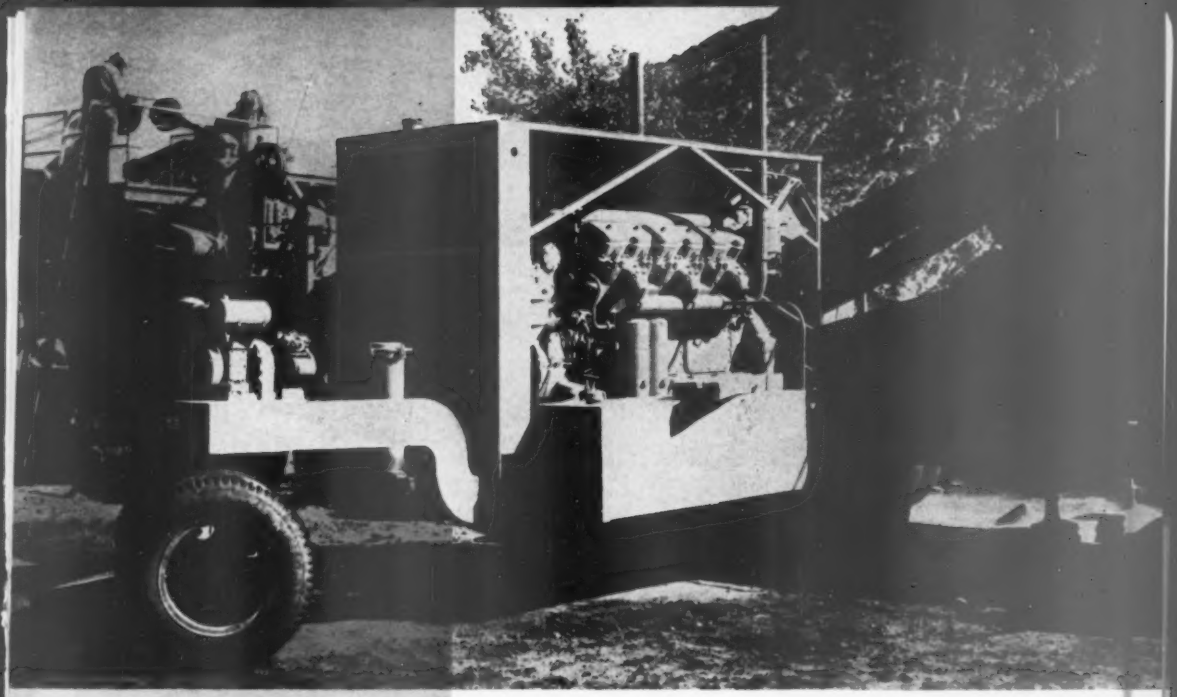
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Whatever your need for dust or fume control, Norblo builds rugged, efficient equipment in Centrifugal, Hydraulic and Bag type collecting systems. These three types, frequently used in certain combinations, provide economical dependable control as required in smelting, rock products, chemical, milling and processing fields. Norblo Systems make outstanding records for high recovery with low operating and maintenance costs. Profit by Norblo 30 years' experience in heavy duty dust collection and Norblo development of these basic types of equipment. For good advice on dust or fume problems, consult Norblo.

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HERE's part of a portable crushing plant operated by Schildberg Construction Co., Greenfield, Iowa. That engine is a D336 "Caterpillar" Diesel, conservatively rated at 400 HP. It powers the primary crusher and hammer mill, while a D4600 drives the screens and conveyor and a D8800 drives the jaw crusher. The plant averages 1,200 tons of crushed rock per day for county secondary roads, as well as limestone dust for agricultural purposes. D. H. Schildberg says: "We have other 'Cat' units on our other job. Since we've seen their trouble-free operation, we specify 'Cat' Diesel power on all of our replacement engines. We get good, dependable service from our dealer."

Standardizing on "Caterpillar" power units is a good move whether you've got a stationary or portable plant. They're ruggedly built to deliver reliable performance at a minimum cost for fuel, repair and maintenance. And field records on the dustiest, toughest jobs *prove* it. What's more, your "Caterpillar" dealer is on duty to provide on-the-job service 24 hours a day!

"Cat" Diesel Engines are built in ten sizes up to 500 HP. The power they promise is the power they deliver. The importance of these engines for both military needs and maintaining the civilian economy is increased by the present situation. Talk over your engine requirements with your "Caterpillar" dealer. He has the complete stock of parts to keep your present equipment in running order and will do his utmost to make prompt delivery of new machines.

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PRODUCTION



CONTROLLED IMPACT ACTION IN WISCONSIN. Portable 3240 Impact Master with 36" x 12' apron feeder, 30" delivery conveyor, Murphy DR6 Diesel. Feeds output to 5' x 14' 3-deck vibrating screen, oversize returns to breaker. Average production 150 tph 2½" minus high quality cubical aggregate.



CONTROLLED IMPACT ACTION IN IOWA. In a free running operation this stationary closed circuit setup averages 28% of 1½" minus plus ¾", 38% of ¾" minus plus #4, and 34% aglime. Percentage of sizes can be changed easily to meet market demands. As high as 180 tph of 1½" minus have been recorded. 135 h.p. electric power.



CONTROLLED IMPACT ACTION IN ILLINOIS. With motors turning at 900 rpm, this 3240 Impact Master is turning out profitable quantities of ¾" minus, and aglime. More than 50% aglime production has been noted.



CONTROLLED IMPACT ACTION IN TEXAS. A high production setup with a minimum plant investment. This portable 3240 Impact Master is equipped with 32' portable apron feeder and GM 6-110 power unit. Capacity of 200 tph of 2" minus.

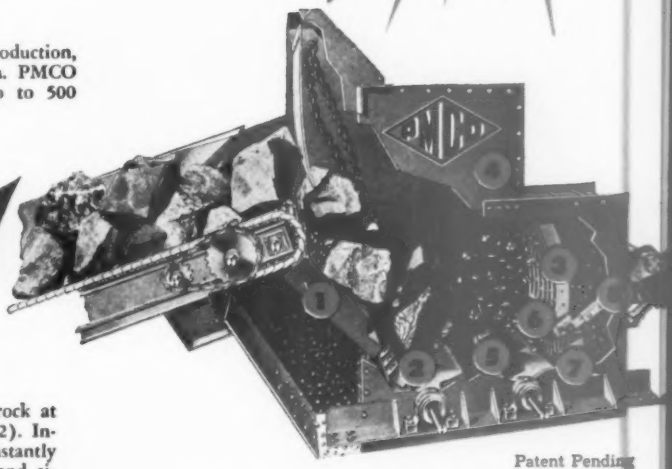
PLUS WITH CONTROLLED IMPACT ACTION

Exclusive operating principle of PMCO Impact Master delivers extra profit-making advantages

- Top capacity
- High ratio of reduction eliminates secondary crushers and auxiliary equipment. Provides a complete high output plant with minimum investment.
- 100% of the breaking is accomplished by rigidly mounted rotor hammers producing a better quality cubical aggregate.
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- Less h.p. per ton of finished material.

Controlled Impact Action adds up to faster production, better production, more profitable production. PMCO Impact Masters are made with capacities up to 500 tph. Write for complete details.

HERE'S HOW IT WORKS



Patent Pending

Adjustable feed plate (1) guides in-coming rock at proper angle into first rotor hammer circle (2). In-fed rock is intercepted in motion, exploded instantly by the terrific impact of the rotor hammers and simultaneously projected toward vertical screen grate (3) where finished sizes are immediately discharged.

Oversize particles are deflected upwards, intercepted by feed chute back plate (4) and guided downward into the path of the second rotor hammer circle (5) where they are exploded and projected toward the bottom half of the vertical screen grate and the lower screen grate (7) for immediate discharge.

Both rotor hammers rotate in the same direction toward the rear, promoting fast feeding and keeping all material flowing toward the discharge for top capacity.

Finished product sizes are controlled by the speed of the rotor hammers, and by simple adjustments (8) of stripper bar (6) and lower screen grate.

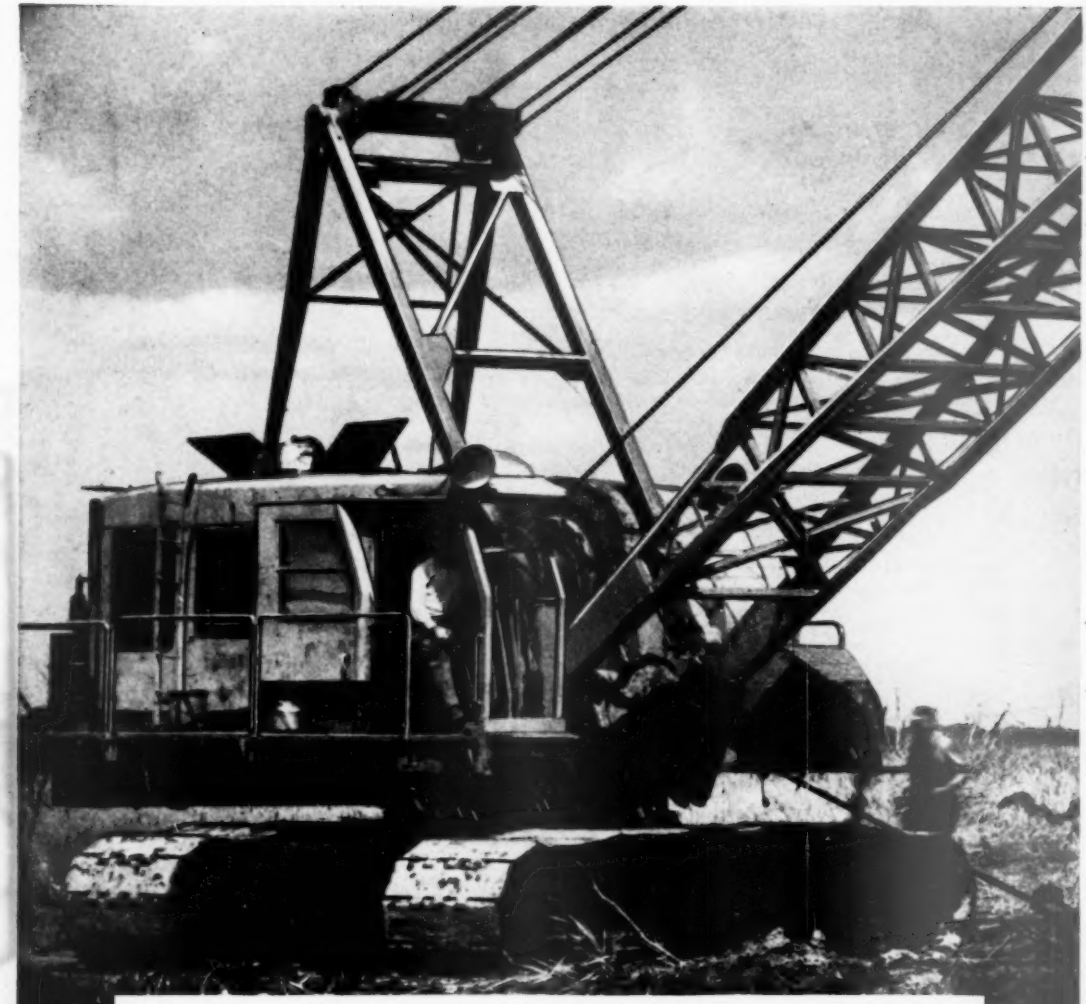
By controlling the in-fed rock and directing its flow, practically 100% of the breaking is accomplished by the rotor hammers. There is no attrition, no abrasive or grinding action. This reduces wear and makes possible a more uniform gradation cubical aggregate.

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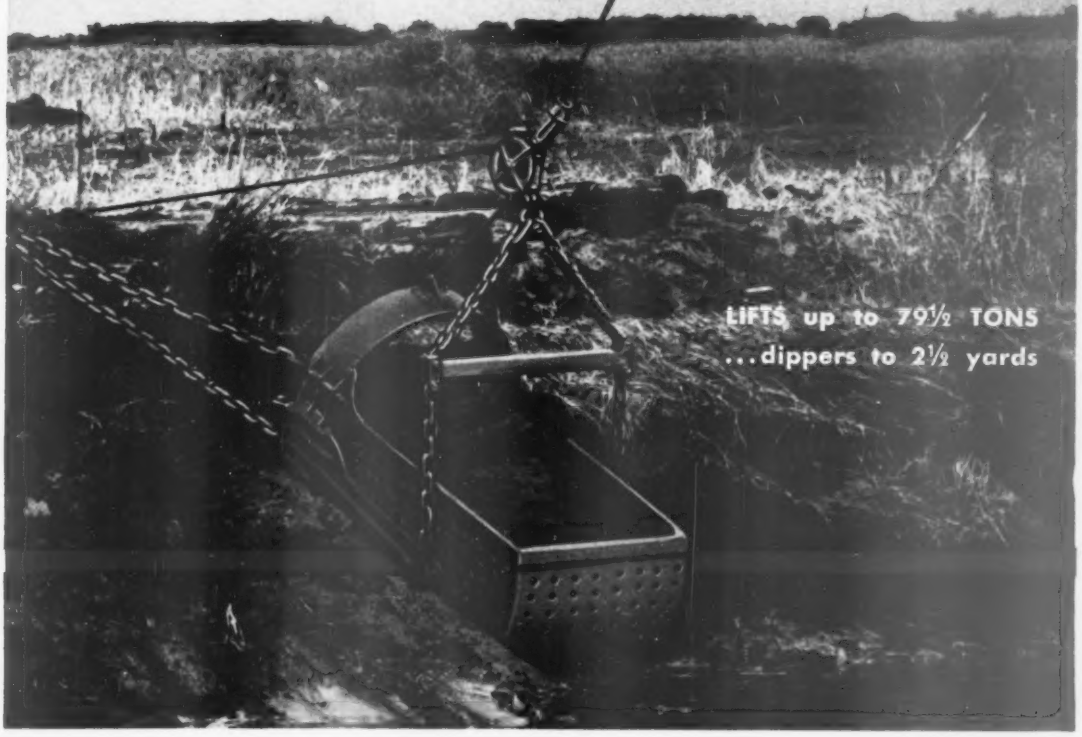
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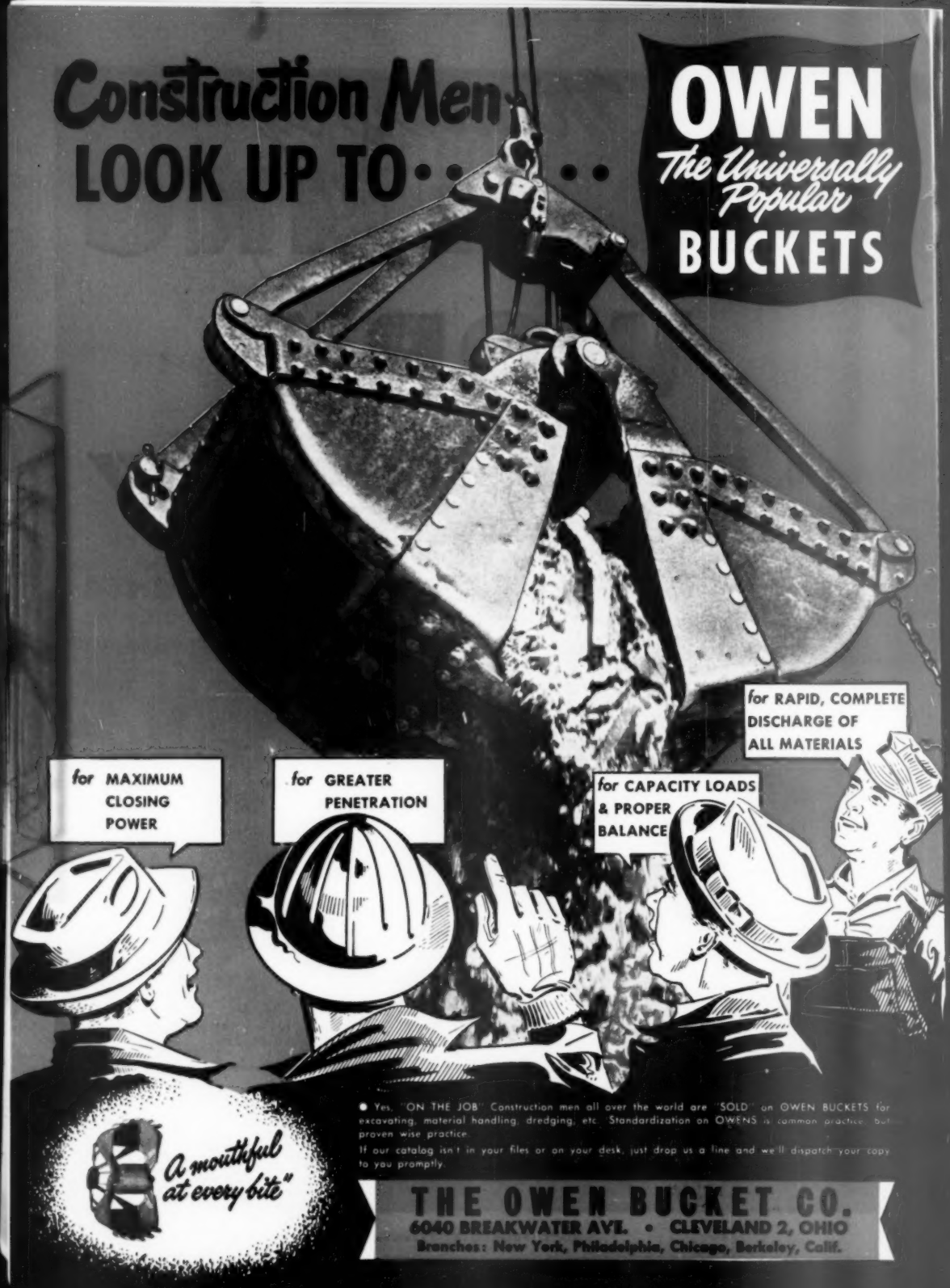
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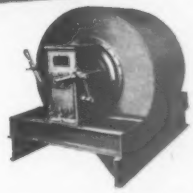
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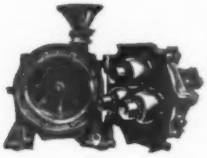
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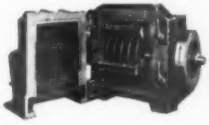
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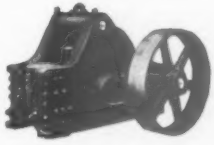
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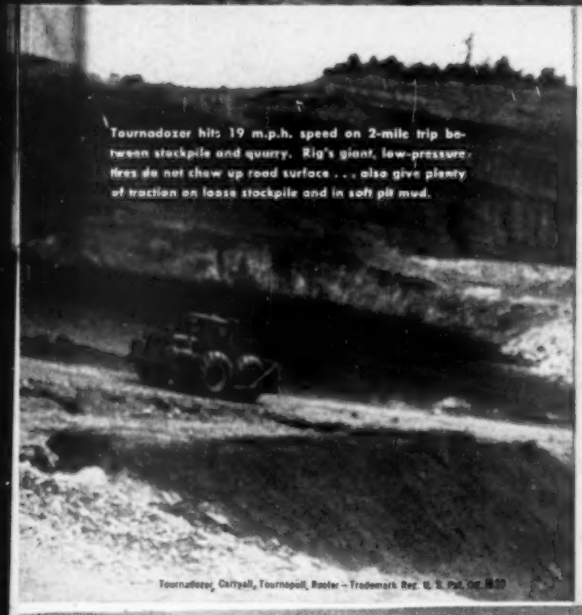
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Tournadozer hits 19 m.p.h. speed on 2-mile trip between stockpile and quarry. Rig's giant, low-pressure tires do not chew up road surface . . . also give plenty of traction on loose stockpile and in soft pit mud.

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HIGH-SPEED, RUBBER-TIRED EXCAVATING • HAULING • LIFTING EQUIPMENT



work of 3 crawlers

Bauxite Mining Company...

Main assignments are cleaning up for a 1½-yd. and a ¾-yd. shovel in the stockpile area . . . and pit clean up of heavy quarry rock around a 2½-yd. stripping shovel. "Spare time" tasks include building levees . . . clearing timber . . . pulling a Rooter . . . towing and pushing trucks up grades and through mud.

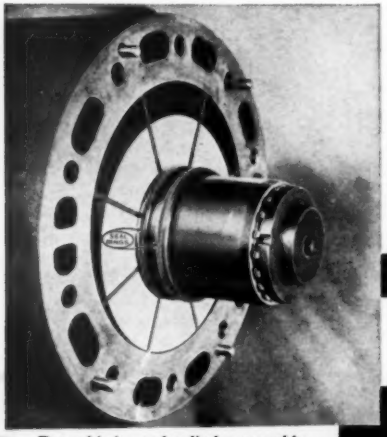
Also self-loads gravel with 15-yd. Carryall . . . completes 7-mile cycle in 40 minutes

Tournadozer is also occasionally used with a LeTourneau 15-yard LP Carryall Scraper to load, haul and spread gravel surfacing material on the mine's road system . . . helping replace about 2,000 yds. of surfacing per mile per year. Timed on a typical 3½-mile one-way haul, the Tournadozer-Carryall team averages 1½ loads an hour. This same outfit also works with a D Tournapull on road-building . . . push-loading the "D", and self-loading the Scraper.

You'll be surprised at the extra jobs you can handle per day and the extra production you can get per hour, with one of these high-speed, rubber-tired C Tournadozers. Call your LeTourneau Distributor for complete facts.

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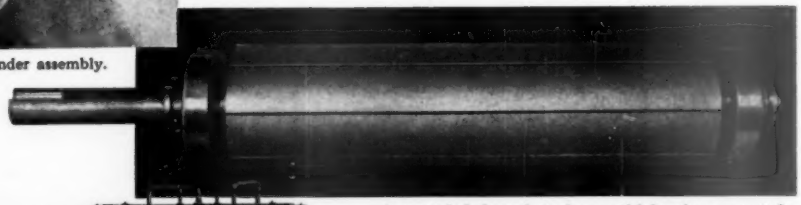
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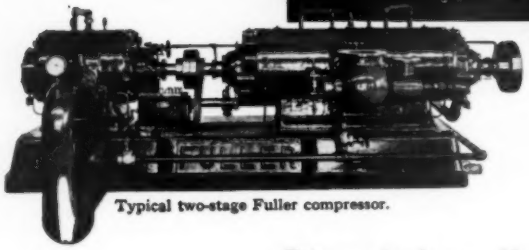
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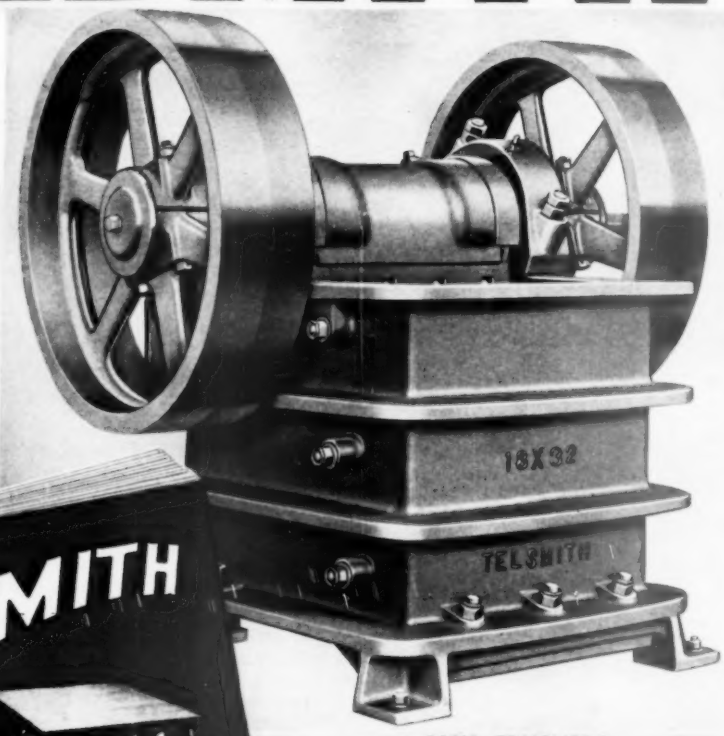
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Jaw Crushers: Sizes: 10 x 16 in. to 30 x 42 in., 22 to 240 tons per hr. capacity.

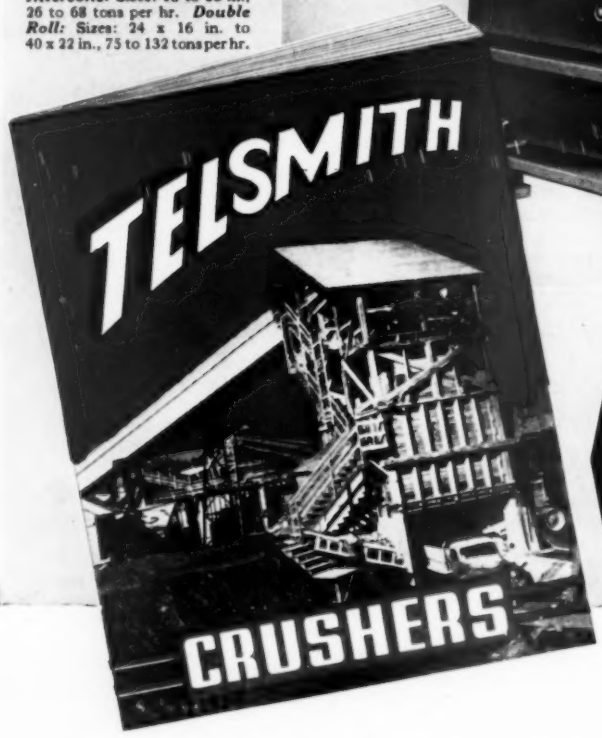
Gyratory Breakers: Sizes: 6B to 25B, 26 to 400 tons per hr.

Secondary Crushers

Gyrasphere: Sizes: 24 to 48 in., 15 to 210 tons per hr. ***Intercone:*** Sizes: 18 to 28 in., 26 to 68 tons per hr. ***Double Roll:*** Sizes: 24 x 16 in. to 40 x 22 in., 75 to 132 tons per hr.



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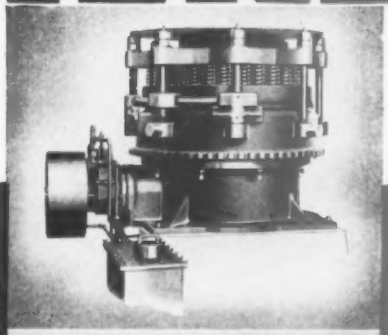
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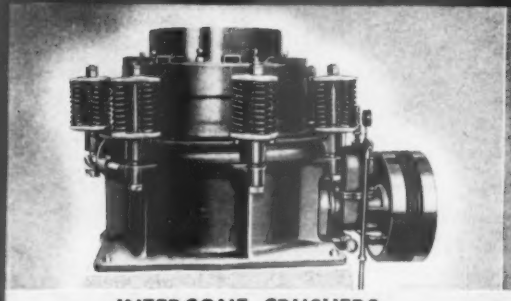
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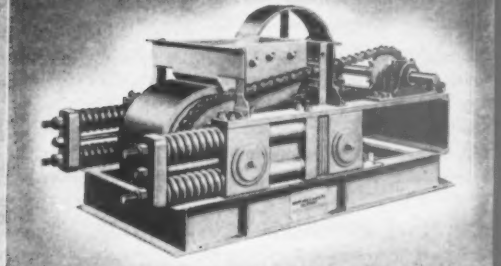
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GYRATORY BREAKERS



INTERCONE CRUSHERS



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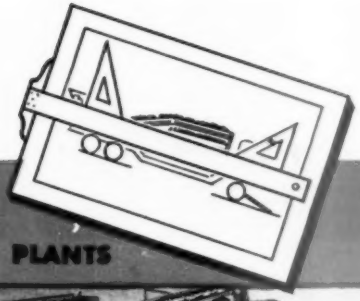
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is the striking setting for this new Lorain 50-I shovel. This Climax, Colorado pit produces 90% of the world's supply of molybdenum, so vital in today's production of steels.

Tough rock digging — and lots of it — is a specialty of this 1-yard Lorain-50 because it is equipped with a shock-absorbing, hydraulic (fluid) coupling that offers many advantages for easy operation, increased production and longer life. It is the only 1-yd. shovel available with this feature as standard equipment! The Lorain-50 story is worth checking with your Thew-Lorain Distributor — to boost production and cut costs in your mine or pit!

LORAIN "50" WITH HYDRAULIC COUPLING LICKS ROUGH-TOUGH DIGGING at Climax, Colorado Pit

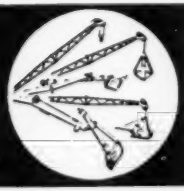
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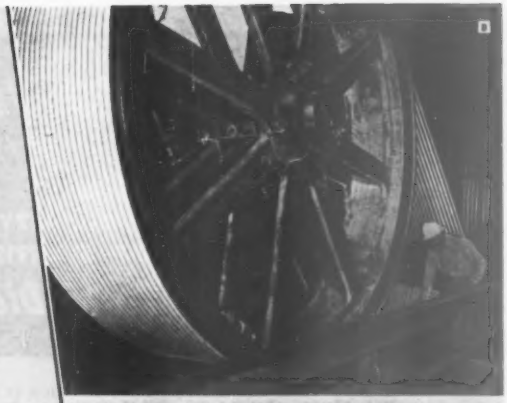
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Gates Vulco Ropes very competently handle the drive on this immense Jaw Crusher, said to be the largest ever built. It supplies most of the coarse rock for rip rap—and for secondary crushing—on the Detroit Dam project, Detroit, Oregon.

There is a very simple reason why Gates Vulco Ropes—the V-belts built with *concave sides*—are giving you substantially *longer wear*—and you can easily prove this for yourself in just 2 minutes' time!

Pick up *any* V-belt whatever and bend it as it bends when going around a pulley. As the V-belt bends, grip its sides with your fingers—and here is what will happen, every time.

If the belt you are bending is a *straight-sided* V-belt, you can *feel* its sides *bulge out* as the belt bends. This out-bulge forces the sides of the belt to press *unevenly* against the V-pulley—as shown in figure 1-A (see accompanying diagrams).

Clearly, this *uneven pressure* against the V-pulley causes the belt to wear *unevenly*—with the wear *concentrated* where the bulge is greatest—and this concentrated wear at one point naturally shortens the life of a *straight-sided* V-belt.

Now, make this same test with the belt that is built with Concave Sides—the Gates Vulco Rope!

Whereas you felt an *out-bulge* when you bent a belt with straight sides, you find that the *Concave Sides* **merely** fill out and become *perfectly straight*. The sides therefore *press evenly* against the V-Pulley. This distributes the wear *uniformly* across the *full width* of the belt. Naturally, this means longer belt life and *lower* belt *costs* for you!

Only V-Belts made by Gates are built with concave sides. Whenever you buy V-Belts, be sure that you get the V-Belt with the Concave Sides—The Gates Vulco Rope!



What Happens When a V-Belt Bends

Straight-Sided V-Belt	Gates Vulco Rope with Concave Sides
Fig. 1	Fig. 2
Fig. 1-A	Fig. 2-A
How Straight-Sided V-Belt Bulges in Sheave -Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear At Point Shown by Arrows.	The Concave Sides Fill out to a Precise Fit in the Sheave Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley—Uniform Wear—Longer Life!

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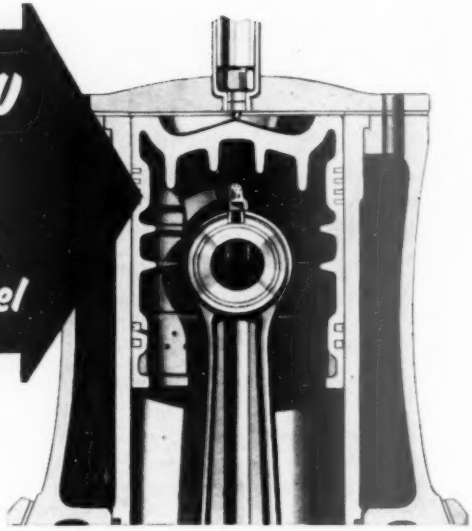
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MORE ECONOMY
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EASIER STARTING

because it's a "True" Diesel



ILLUSTRATED at the right in cross section is the combustion chamber of the Murphy Diesel. Note that it is plain and open with no artificial devices to effect combustion. In operation, completely atomized liquid fuel is sprayed directly into all parts of the air charge by means of the unit injector located in the center of the combustion chamber. Since the fuel burns immediately upon injection into the incandescent air charge, combustion is controlled solely by the unit injector, which in turn is precisely controlled by the hydraulic servo-type governor. This is "true" diesel operation.

To the Murphy owner it means more power from each drop of fuel and less wear and tear on the engine . . . lower costs in all ways.

More details on "true" diesel operation as well as other Murphy features are given in the booklet "10 Questions to Ask a Diesel Engine Salesman." Ask your Murphy Diesel Dealer for a copy or write direct.

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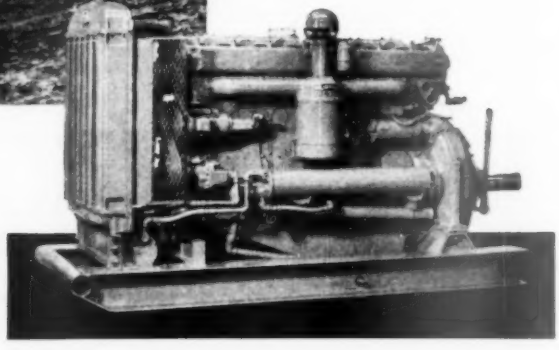
Illustrated is a 30" x 42" Pioneer jaw crusher owned by H. E. Sargent, Stillwater, Maine, and powered by a 6 cylinder Murphy Diesel. The rugged construction, fast response and operating economy of Murphy Diesels make them ideal for this type of service.

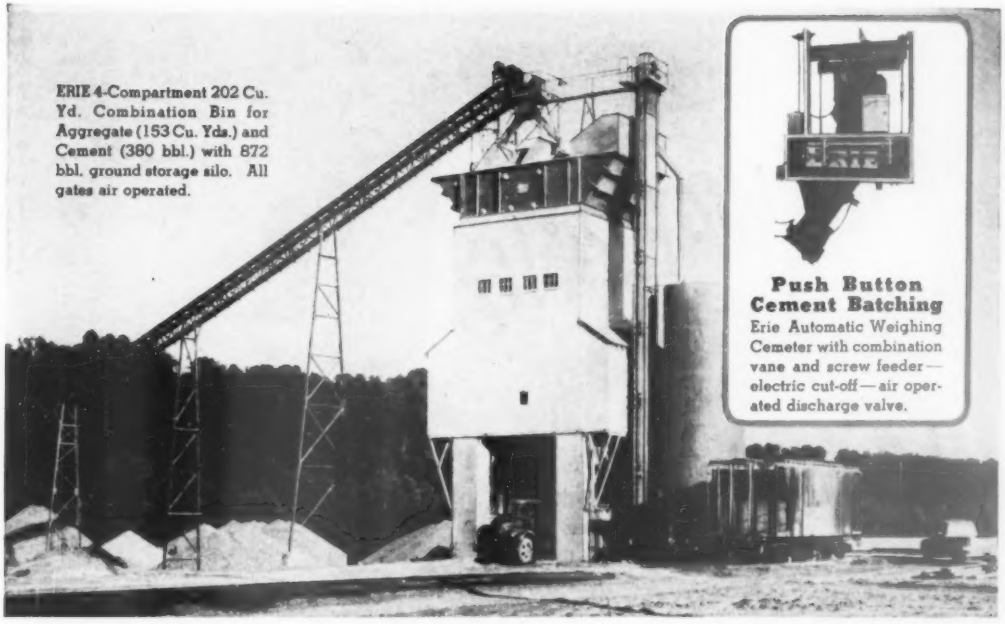
MURPHY DIESEL

Heavy duty power

for rock crushing

Murphy Diesel Engines and Power Units for portable or stationary crushing plants, 90 to 226 H. P. 1200 and 1400 RPM. Generator Sets, 60 to 140 K.W. 209





ERIE 4-Compartment 202 Cu. Yd. Combination Bin for Aggregate (153 Cu. Yds.) and Cement (380 bbl.) with 872 bbl. ground storage silo. All gates air operated.

Push Button Cement Batching

Erie Automatic Weighing Cemeter with combination vane and screw feeder—electric cut-off—air operated discharge valve.

AN ERIE *High Speed* CENTRAL MIXING PLANT

Crane transfers sand and stone from river barge to stock piles. Tunnel belt conveyor under stock piles is loaded by push button air operated gates. A control panel, located on the ground near the junction of the tunnel and inclined belt conveyors, flashes the high and low bin signal lights to guide operator in directing proper material from stock piles. The material level in the 4-Compartments is automatically maintained within a set high-low range.

BATCHING OF CEMENT AND AGGREGATE IS FAST AND ACCURATE

ERIE 2 Cu. Yd. AggreMeter with hand controlled air operated charging and discharge gates—3 Beam Scale with over and under dial.

ERIE Cemeter with 2 Beam Scale and electric cut-off weighs cement automatically—hand controlled air operated discharge valve. Cement and aggregate is discharged into 2 -2 Cu. Yd. Mixers with a yield of 100 to 125 Cu. Yds. of concrete per hour under rigid inspection.



DIG MORE *and* FASTER

ERIE Clamshells are carefully designed to eliminate useless deadweight. They are available in 4 types—Rehandler—General Purpose—Barge Type and Hard Digger. Each in a complete range of capacities to provide the correct bucket for crane—job and material. Write for Cat. 2L-2.

We Doubled the bin capacity in the ERIE Portable Concrete Plant. It now holds 40 cu. yds. This reduces frequency of truck deliveries of aggregates and keeps material always in good supply. Investigate the economy of making 30 to 40 cu. yds. per hour of specification concrete on the job. An auxiliary bucket hoist is also available to speed concrete to forms or truck. Write for catalog. Describe your concrete job.



ERIE

STEEL CONSTRUCTION COMPANY

723 GEIST ROAD • ERIE, PENNSYLVANIA



NO WARPING, LESS DOWNTIME



with Segmental Kiln Ends Cast in Thermalloy

These segmental kiln ends designed by Electro-Alloys will lengthen kiln life, reduce downtime, and greatly speed replacement. Records show kiln ends lasting as long as 15 years, thanks to the protection against warping provided by these heavy-duty Thermalloy ends.

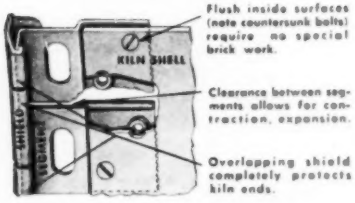
INSTALLATION IS EASIER because there's no special brick work needed. Segments are fastened with bolts countersunk on the inside of the kiln, eliminating any need for special brick work and providing a perfectly flush surface for the brick lining.

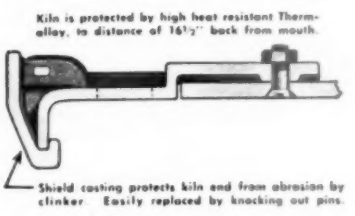
WARPING IS GREATLY REDUCED because, (1) segmental design allows for expansion and contraction without permanent set of the kiln shell, and (2) segments completely shield kiln ends from clinker and flame leakage to a depth of 16½" back from the mouth of the kiln. Yet you don't shorten the effective operating length of the kiln.

ONE-MAN REPLACEMENT is made possible with segmental design; the maximum weight to be handled at any one time is 35 lbs. Shield segments—which bear the brunt of flame leakage and clinker abrasion—can be removed by simply knocking out the pins which secure them, and replacing with new shield.

LENGTHEN SERVICE LIFE OF YOUR KILN next time you're replacing or installing a kiln end—let one of our engineers show you how we can lengthen its life for you. Simply write Electro-Alloys Division, 2146 Taylor St., Elyria, Ohio.

VIEW FROM INSIDE KILN



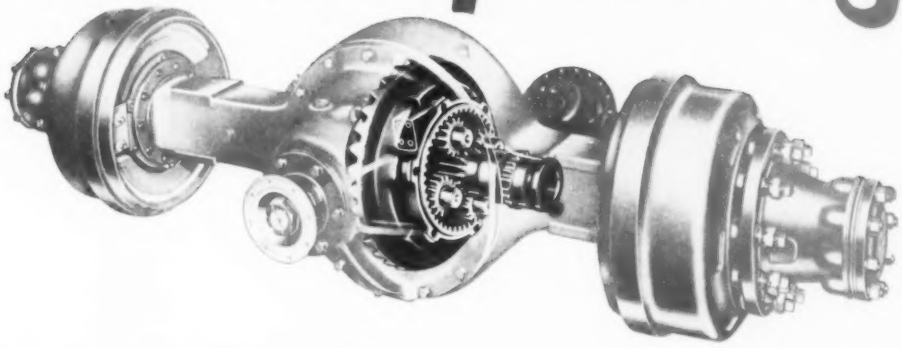


*T. M. Reg. U. S. Pat. Off.

AMERICAN Brake Shoe COMPANY

ELECTRO-ALLOYS DIVISION
ELYRIA, OHIO

Planetary Gearing



saves stress & wear-adds to axle life!

WITH Eaton's planetary construction, gear tooth loads are distributed over four "planet gears," holding stress and wear on any one gear tooth to a minimum. These four gears are completely locked out in the high speed range. In the low speed power range, they rotate at slow speeds. The result is quiet operation; easy, clash-free shifting at all truck speeds; minimum wear; materially longer axle life. The rugged planetary design and forced flow lubricating system—both exclusive Eaton features—enable Eaton 2-Speeds to set unequalled life and performance records. Your truck dealer will explain how Eaton 2-Speeds also reduce stress and wear on the engine and power transmitting parts—how they help your trucks haul more, faster, longer, at lower cost.



Axle Division
EATON MANUFACTURING COMPANY
CLEVELAND, OHIO

EATON
2-Speed Truck
AXLES

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

BAY CITY - the biggest value in ¾ yard machines . . . . easily convertible

Quick convertibility without machinery change is a feature that gives you more for your equipment dollar when you buy BAY CITY. Then too, you get ruggedness, dependability and long life that can't be matched.

Well balanced for Crane Work.

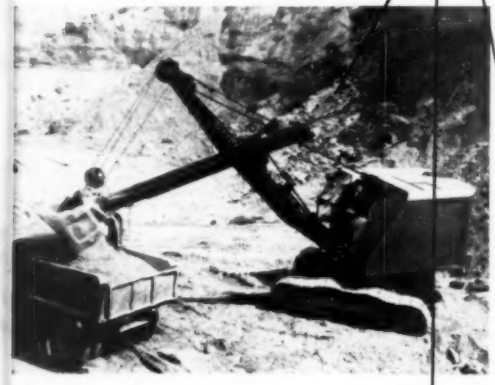
Stability for low boom operations.

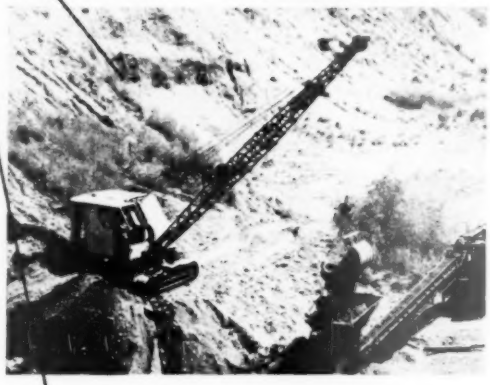
Easy operation for hard digging.

High line speeds for faster material handling.

Power for fast digging cycle.

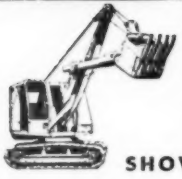












BAY CITY

BAY CITY SHOVELS, INC., BAY CITY, MICHIGAN



SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS



Still going strong after a quarter century. That's the record of the older motors shown in the above illustration. And when more motors were needed South Dakota State Cement again turned to Allis-Chalmers.

ALLIS-CHALMERS
Synchronous MOTORS

All these motors have the tough job of driving wet raw grinding ball mills. The two installed in 1924 are 400 hp, 1.0 pf, 180 rpm. The 1950 motor and a duplicate not shown are 350 hp, .8 pf, 180 rpm.

Designed for low starting kva, the motors drive the mills through magnetic clutches. The mills themselves and the Type H full-voltage starters were also built by Allis-Chalmers.

If you could examine the motors in this Rapid City installation, you would soon discover some of the reasons for their long life and low maintenance. You would find liberally proportioned bearings for trouble-free operation. You would find field coils securely supported and protected by adequate pole collars. And you would find many other important features.

But there would be many features you would not be able to see. You wouldn't see the testing that assured satisfactory steel for the stator laminations. Nor the precisely controlled processing that results in long insulation life. Nor any of the many ways in which each motor is engineered to fit its specific application.

We suggest that you get a copy of our illustrated Bulletin 05B7648. In a few minutes, this *new* bulletin will show you why you'll be money and years ahead with Allis-Chalmers low-speed pedestal-bearing synchronous motors on the job. Ask your nearby A-C representative for a copy, or write to Allis-Chalmers, Milwaukee 1, Wisconsin. A-3533

ALLIS-CHALMERS

RAYMOND HIGH SIDE ROLLER MILL



The Raymond High Side Roller Mill provides an automatic, dust-free, completely integrated system for fine grinding and classifying a great variety of non-metallics, as well as simultaneously removing surface moisture from materials being ground.

Some of the modern features of this unit include:—

Unusually wide range classification with easy adjustment for fineness control.
Automatic throwout attachment for rejection of impurities.

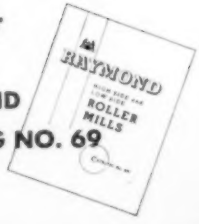
Pneumatic feed control system for peak grinding efficiency.

Flash Drying accessories available for removing surface moisture while grinding.

With the many sizes and types of Raymond Roller Mills available, you can obtain a unit tailored for your particular production requirement. Tell us about your operation — Raymond engineers will be glad to recommend the proper equipment.



Write for NEW RAYMOND CATALOG NO. 69



COMBUSTION

Raymond

PULVERIZER DIVISION

built to Modern Production Standards

Whizzer SEPARATION



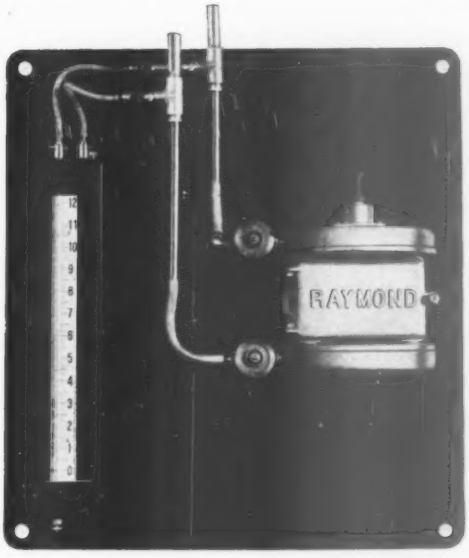
The Whizzer Separator built as an integral unit of the High Side Roller Mill combines all the desirable features required of a modern classifier including reserve separating capacity, unusually wide range of available fineness, simple fineness adjustment, and exceptionally high product uniformity.

Whizzer Separators are available in two types. The Single Whizzer unit is designed for classification in the ranges all passing 20 mesh to about 95% passing 200 mesh. The Double Whizzer Separator, illustrated, is recommended where products up in the range of 99% or better passing 325 mesh are required.

Pneumatic FEED CONTROL

This modern feed control panel board is the "heart" of the Raymond Roller Mill operation. It takes over the responsibility of maintaining the mill at peak capacity, and provides the mill with just the right amount of feed for all conditions.

The complete panel board is now furnished as standard equipment with all Raymond Roller Mills. The control unit is actuated by pressure changes in the air system of the mill, and controls the rate of feed according to the exact load of the mill.



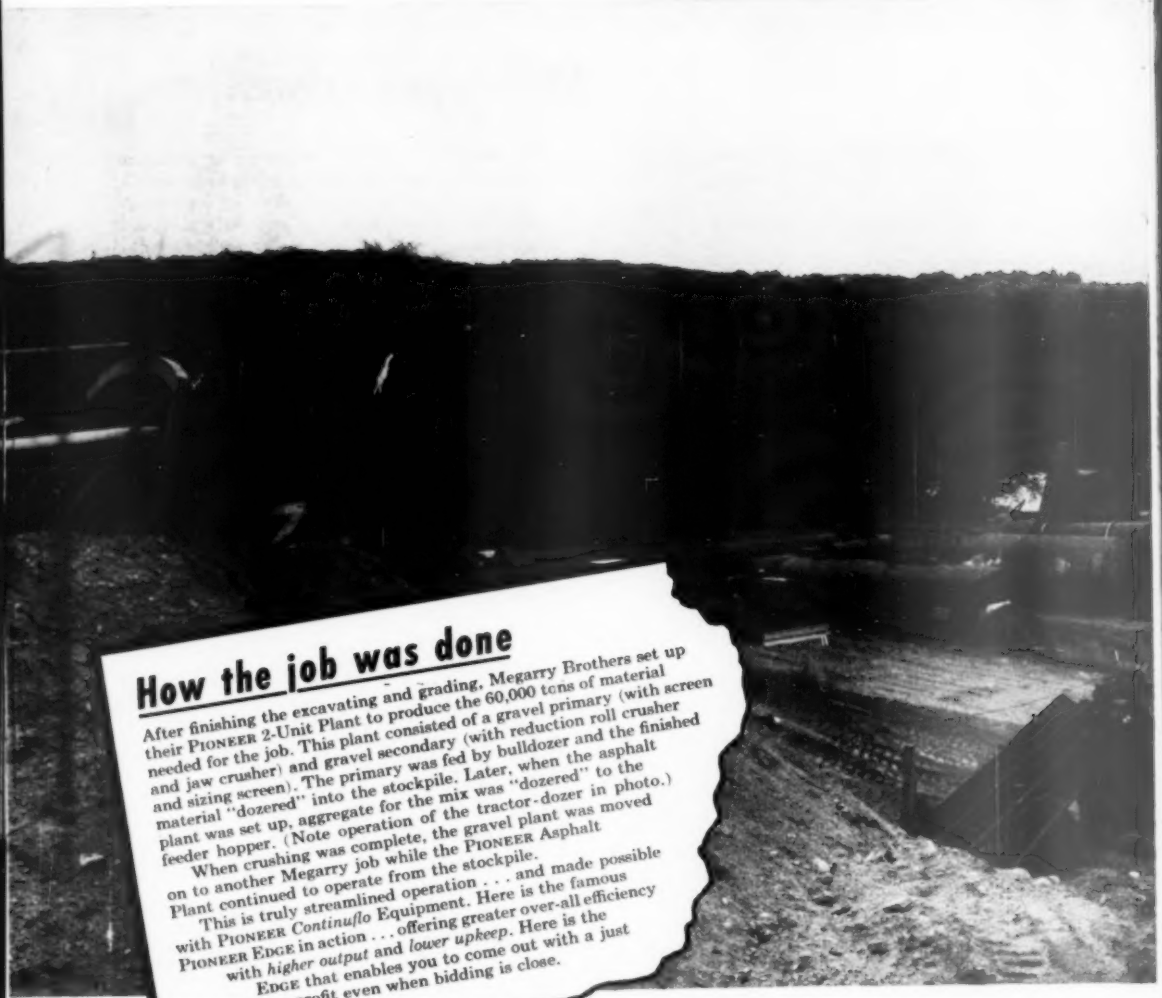
ENGINEERING-SUPERHEATER, INC.

1307 NORTH BRANCH STREET . . . . . CHICAGO 22, ILLINOIS

Sales Offices in Principal Cities

When you've more jobs ahead...

that Pioneer Edge



How the job was done

After finishing the excavating and grading, Megarry Brothers set up their PIONEER 2-Unit Plant to produce the 60,000 tons of material needed for the job. This plant consisted of a gravel primary (with screen and jaw crusher) and gravel secondary (with reduction roll crusher and sizing screen). The primary was fed by bulldozer and the finished material "dozered" into the stockpile. Later, when the asphalt plant was set up, aggregate for the mix was "dozered" to the feeder hopper. (Note operation of the tractor-dozer in photo.)

When crushing was complete, the gravel plant was moved on to another Megarry job while the PIONEER Asphalt Plant continued to operate from the stockpile.

This is truly streamlined operation . . . and made possible with PIONEER *Continuflo* Equipment. Here is the famous PIONEER EDGE in action . . . offering greater over-all efficiency with *higher output* and *lower upkeep*. Here is the EDGE that enables you to come out with a just profit even when bidding is close.

BUY BOTH!
HIGHER OUTPUT
LOWER UPKEEP

Pioneer

Continuflo EQUIPMENT

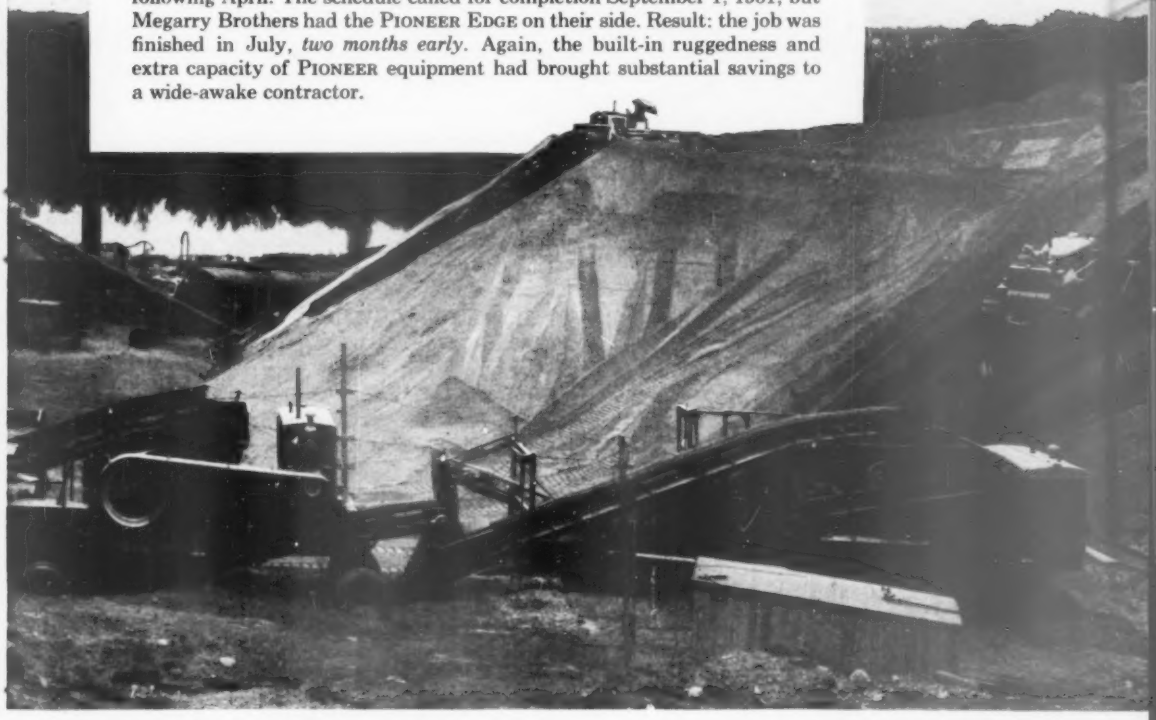
gets you there sooner

Megarry completes job 2 months early

Completing the job ahead of schedule is routine for Megarry Brothers of St. Cloud, Minnesota.

Take, for example, this $256,946.00 job on Minnesota State Highway 7 between Excelsior and Minneapolis. This 12.2 mile stretch called for 16,578 cubic feet of excavation and placing 35,171 tons of gravel base. The resulting 499,420 square yards of surface required 50,686 tons of bituminous mix. Finally, 2,136 tons of seal coat aggregate were placed on top.

Work began October 1950, and after a winter layover, was resumed the following April. The schedule called for completion September 1, 1951, but Megarry Brothers had the PIONEER EDGE on their side. Result: the job was finished in July, *two months early*. Again, the built-in ruggedness and extra capacity of PIONEER equipment had brought substantial savings to a wide-awake contractor.



Megarry Brothers choose Pioneer

● Megarry Brothers have found that dependable equipment is the key to efficient performance on a construction job. Here is some of the PIONEER equipment they own and operate.

1 Model 101 Portable Asphalt Plant consisting of a drier, dust collector, and combination gradation-mixing unit.
1 Auxiliary drier.
2 2-Unit Portable Plants each consisting of a 150 PG Primary and 140S Secondary.
2 40 V Duplex Portable Crushing Plants.
1 38 V Duplex Portable Crushing Plant.
1 305 W Washing Plant.

PIONEER ENGINEERING WORKS
1515 Central Avenue • Minneapolis 13, Minnesota
(Subsidiary of Poor & Company • Chicago)

● Please send me information on the equipment checked.

☐ BITUMINOUS PLANTS	☐ ROLL CRUSHERS	☐ MECHANICAL FEEDERS
☐ GRAVEL PLANTS	☐ WASHING PLANTS	☐ VIBRATING SCREENS
☐ ROCK PLANTS	☐ APRON FEEDERS	☐ BUZZER SCREENS (LIGHT DUTY)
☐ JAW CRUSHERS	☐ ORO FEEDERS	☐ CONTINUFLO CONVEYORS

*Name*_____

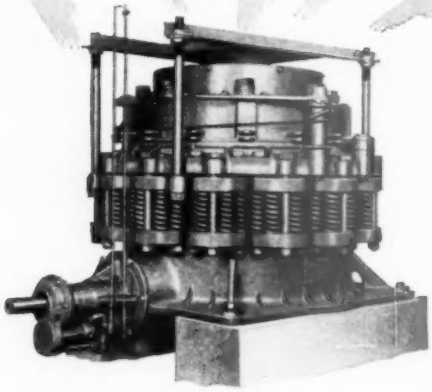
*Company*_____

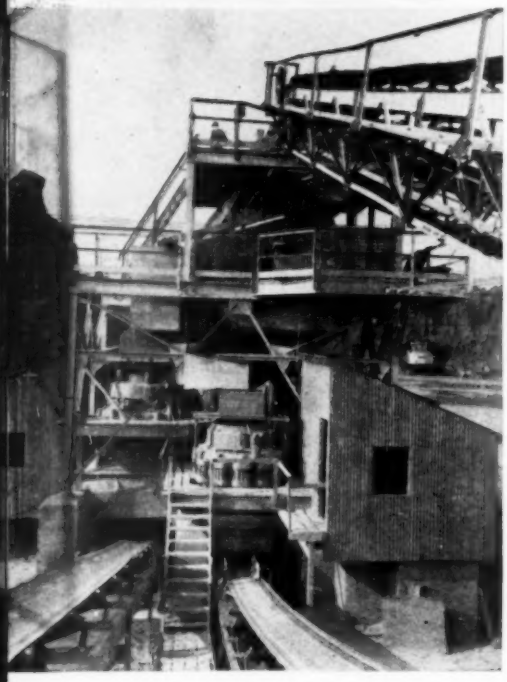
*Address*_____

*City*_____ *Zone*____ *State*_____

Symons Cone Crushers

. . . UNSURPASSED For Fine Low Cost Crushing of GRANITE and TRAPROCK





Three "SYMONS" Cone Crushers (two 4-ft. and one 7-ft.) used in the secondary tower of the Kingston Trap Rock Co., Kingston, N.J. This is one of scores of similar "SYMONS" Cone Crusher installations.

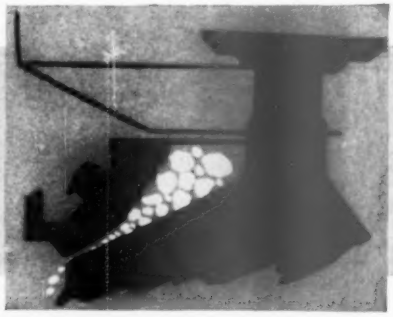
THE action of the *"SYMONS"* Cone Crusher makes it ideal for fine crushing of granite and traprock at low cost. Because of the rapid gyration and wide throw of the head the material being crushed receives a series of rapid hammer-like blows as it passes downward through the crushing cavity. Free fall of material between the timed series of sharp impacts —rather than the material just being "pinched" by a slow, short throw head—results in less wear from abrasion.*

The hundreds of *"SYMONS"* Cone Crushers being used by major producers of crushed granite and traprock are evidence that these Nordberg built crushers are unsurpassed for this hard, tough, abrasive rock.

Write for details on a size and type of *"SYMONS"* Cone Crusher to meet your specific requirements.

***MAXIMUM LINER UTILIZATION**

With the Symons process the crushing action occurs throughout the entire length of the cavity. The resulting uniform manganese wear means minimum scrap loss and low manganese cost per ton of crushed product.



NORDBERG MFG. CO.
MILWAUKEE 7, WISCONSIN
NEW YORK • SAN FRANCISCO • WASHINGTON • SPOKANE
MEXICO, D. F. • LONDON • TORONTO • JOHANNESBURG

"SYMONS," a Nordberg trademark known throughout the world

C251-R

NORDBERG

Machinery for processing ores and industrial minerals



"SYMONS" PRIMARY CRUSHERS



"SYMONS" VIBRATING BAR GRIZZLIES



"SYMONS" ROD DECK SCREENS



GRINDING MILLS



MINE HOISTS



DIESEL ENGINES



"and from the best makers, lady!"

These are well made and give dependable service, the sidewalk merchant implies. Was there ever an eager salesman who didn't!

To the men who order more than 85 per cent of all Multiwall bags, reliability of manufacturer is one of the most important considerations*.

But it must be a *proved* reliability.

Union reliability has been demonstrated by 76 years of unbroken leadership in paper packaging. Union's mammoth Savannah plant, world's largest integrated pulp-to-container mill, produces Multiwalls by the million.

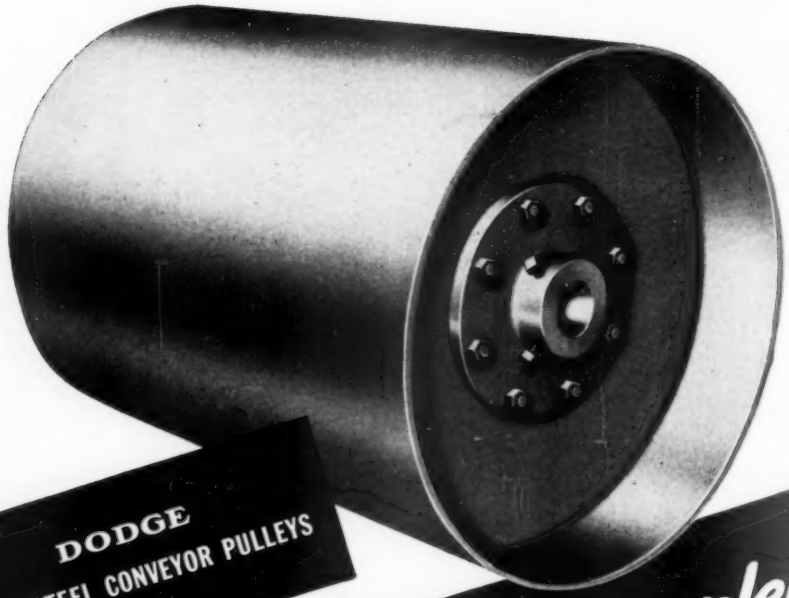
Capacity and fair treatment are among the many good reasons why, with a free choice of all Multiwall manufacturers, major buyers are specifying UNION Multiwalls to a greater extent than ever before.

More so every day . . .

IT'S UNION FOR MULTIWALLS

*August, 1951 research study.

UNION BAG & PAPER CORPORATION • WOOLWORTH BUILDING, NEW YORK 7



DODGE
SOLID STEEL CONVEYOR PULLEYS

So-o much Simpler!



- The pulley for *modern* belt conveyors.
- Drum type construction provides maximum strength with minimum weight.
- Interchangeable hubs simplify installation, positioning, removal — insure better conveyors at *less* cost.
- Accurately formed. Uniform rim thickness. Fully enclosed — to exclude dust, dirt, water.
- Diameters 6 in. to 8 ft., all face widths. Popular sizes stocked by our distributors.

DODGE
of Mishawaka, Ind.

DODGE MANUFACTURING CORPORATION
2600 Union Street, Mishawaka, Indiana

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Equipment" in your classified telephone directory.



FIRST IN POWER TRANSMISSION MACHINERY!



V-BELTS AND TAPER-LOCK SHEAVES



TORQUE-ARM SPEED REDUCERS



DODGE-TIMKEN PILLOW BLOCKS



ROLLING GRIP AND DIAMOND E CLUTCHES



Amateur Standing...
in need of an expert!

When considering a bag for your product, remember that this important selection also requires the attention of an expert. Call in your technically trained Chase Salesman. You can then be *sure* that the bag is designed to fill your specific needs. You can be *sure* that it is attractive, that it protects your product, that it will help sell your product. Remember, next time—every time—consult your Chase Salesman.

BAGS FOR ALL INDUSTRY AND AGRICULTURE

- cotton bags of all kinds
- paper and Multiwall bags
- Saxolin open mesh bags
- Topmill burlap bags
- combination bags, liners and specialties

SINCE 1847

for Better Bags...Better Buy Chase

CHASE BAG CO. GENERAL SALES OFFICES: 309 W. JACKSON BLVD., CHICAGO 6, ILL.

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OKLAHOMA CITY • PORTLAND, ORE. • REIDSVILLE, N. C. • HARLINGEN, TEXAS • CHAGRIN FALLS, O. • WORCESTER, MASS. • CROSSETT, ARK. • SAN FRANCISCO

HERE'S WHAT USERS SAY ABOUT THE DEMPSTER-DIGGSTER—

"IT'S THE FASTEST, MOST EFFICIENT EXCAVATING TOOL I HAVE USED"

—A. J. METLER, *Contractor*

"During the past several years," Mr. Metler says, "I have owned and operated four conventional full revolving crawler and truck mounted shovels and cranes and know that they have a direct application to many types of excavating work.

"On the other hand, I have learned that the fast operation of the tricycle mounted Dempster-Diggster permits it to be used on certain types of work to a considerable advantage. Its mobility permits quicker transfer from one job to another.

"I have had excellent results from the Dempster-Diggster and consider it the fastest and most efficient excavating tool I have used."

Mr. Metler is one of the many contractors who has found the Dempster-Diggster to be "the fastest and most efficient excavating tool" available.

This speed and efficiency in excavation work is accounted for, mainly, by the Diggster's exclusive independent hydraulic crowd and hoist action, its hydraulic steering and wheel-type traction.

The power crowd permits bucket to keep digging until loaded . . . no digging with wheels. The hydraulic steering gives the driver sensitive, easy, finger-tip control. When accelerated, a one-handed twist of the steering wheel puts the machine in any desired position. By operating on rubber-tired wheels, the Diggster, of course, can move at the fastest possible speed on the job and to and from jobs.



The Type HL Dempster-Diggster is equipped for extraordinary high dumping. The bottom of bucket is 13 feet six inches above ground.



HERE IS THE NEW TYPE HL DEMPSTER-DIGGSTER shown excavating with a 1¼ cu. yd. (heaped) digging bucket. The Type HL Dempster-Diggster will dig through an 18 foot bank while the Type GRD digs through a 15 foot bank.

The Dempster-Diggster is a "must" for contractors, large or small operators alike.

The Dempster-Diggster has a 15 foot turning radius, is 20 feet long when bucket is in traveling position, and is nine feet and six inches in height.

Four standard interchangeable buckets of two types are available. Digging buckets with four bottom teeth in 1 and 1¼ cubic yard (heaped) capacities, and materials handling buckets in 1½ and 2 cubic yard (struck) capacities.

For fast, efficient operation in difficult terrain, the Diggster is available with crawler-type traction.

"I have not personally used the Dempster-Diggster mounted on crawler treads," Mr. Metler said, "but have seen it in operation on jobs adjacent to mine. I know it is a very effective tool and has many applications."

Construction men have found that on big jobs the Dempster-Diggster has no equal for working in tight places and for freeing big shovels for heavier work. The Diggster has an 8 foot 10 inch crowing reach, will dig through a 15 foot bank, and will dig 15 inches below grade.

Pound for pound, the Dempster-Diggster will out dig and out load any other available competing machine in tough going! Let us prove that statement!

Write today for complete information and prices. The Dempster-Diggster is a product of Dempster Brothers, Inc.

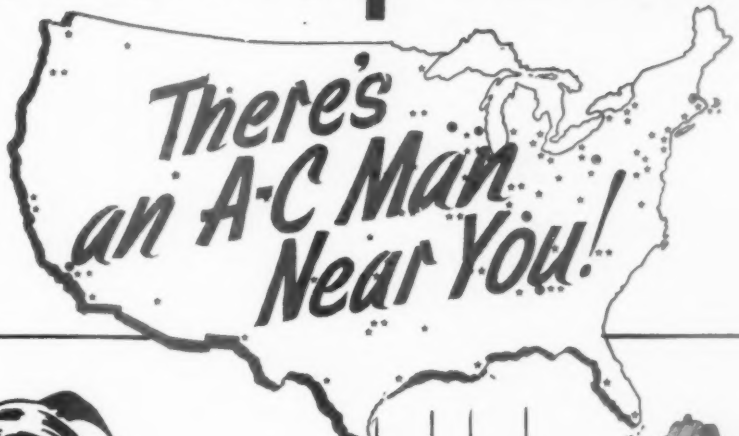


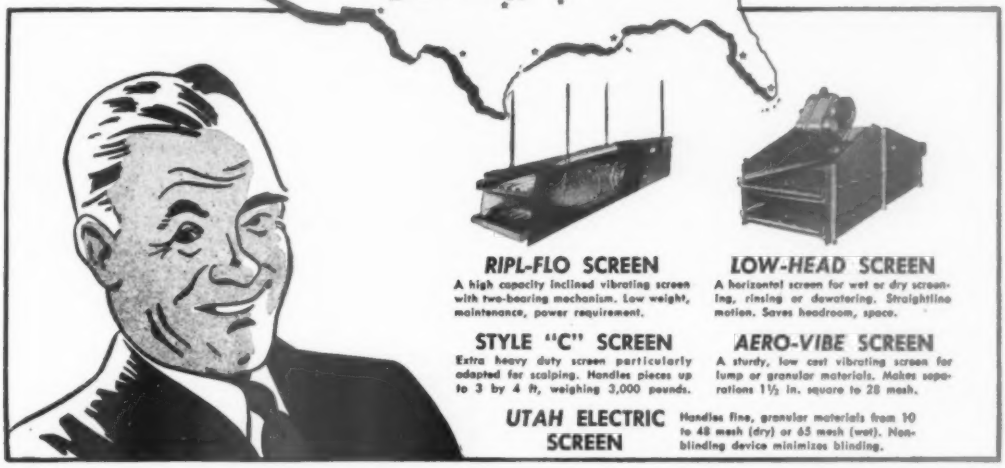
This is the type GRD Dempster-Diggster, which Contractor A. J. Metler considers "the fastest and most efficient excavating tool I have used." It is shown digging 15 inches below grade.

DEMPSTER DIGGSTER

DEMPSTER BROTHERS
3121 N. Knox
Knoxville 17, Tennessee

Want Help WITH SCREENING?





RIPL-FLO SCREEN
A high capacity inclined vibrating screen with two-bearing mechanism. Low weight, maintenance, power requirement.

LOW-HEAD SCREEN
A horizontal screen for wet or dry screening, rinsing or dewatering. Straightline motion. Saves headroom, space.

STYLE "C" SCREEN
Extra heavy duty screen particularly adapted for scalping. Handles pieces up to 3 by 4 ft, weighing 3,000 pounds.

AERO-VIBE SCREEN
A sturdy, low cost vibrating screen for lump or granular materials. Makes separations 1½ in. square to 28 mesh.

UTAH ELECTRIC SCREEN
Handles fine, granular materials from 10 to 48 mesh (dry) or 65 mesh (wet). Non-blinding device minimizes blinding.

ALLIS-CHALMERS district offices offer you the services of experienced vibrating screen engineers. These men are specialists who have the training and experience to help you get top screening performance and lowest screening costs for your job.

These experts will come into your plant, look over your present equipment, and suggest how your screening can be made a more profitable operation. Their recommendations are unbiased because Allis-Chalmers builds *all* types of vibrating screens . . . for *any* screening application. All Allis-Chalmers screens can be obtained complete with motor, drive and control.

Feel free to call on Allis-Chalmers for real help in solving screening problems. You'll be getting the finest engineering and experience available anywhere. Allis-Chalmers, Milwaukee 1, Wisconsin. A-3541

Pulverator, Low-Head, Ripl-Flo, Aero-Vibe and Utah are Allis-Chalmers trademarks.

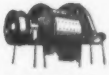
ALLIS-CHALMERS

Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.


Pulverators


Vibrating Screens

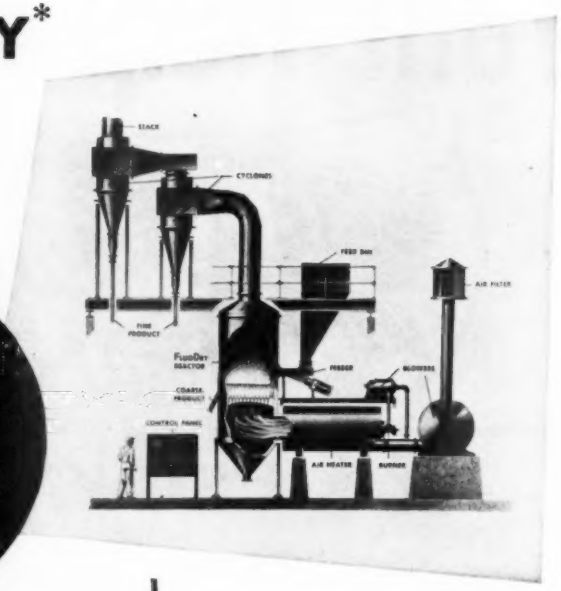

Jaw Crushers


Grinding Mills


Gyratory Crushers


Kilns, Coolers, Dryers

the Dorrco FLUO DRY* system...



A new method of drying surface moisture, of accurately dry-sizing in the 28 to 100 mesh range, and of low temperature heat conditioning through the use of fluidization.



LIMESTONE AND DOLOMITE FINES—FluoDry can dry limestone or dolomite fines as produced, or as reclaimed from stockpile, and recover them as such salable products as limestone sands, agstone or higher-priced fillers.

INDUSTRIAL MINERALS—FluoDry can dry industrial minerals such as phosphate rock, potash and ilmenite sands with greater efficiency and economy than conventional methods.



SAND PRODUCTS—FluoDry can dry, or selectively size, sand products in those ranges where the material is too fine to screen and too coarse for air separation.



OTHER APPLICATIONS—FluoDry has numerous conditioning applications such as surface activation of ilmenite and cobalt concentrates ahead of flotation, dehydration of clay and shale products, and other low temperature treatment problems.



If these facts... sound interesting and you have an active problem of drying or sizing, we will be glad to discuss it in detail.

What are the advantages of FluoDry as compared with conventional drying and sizing methods?

1. More accurate temperature control
2. Lower fuel requirements
3. Lower maintenance costs
4. Lower investment cost
5. Lower operating cost
6. No moving parts

* Trademark, Reg. U. S. Pat. Off.

DORRCO

DORR

WORLD - WIDE RESEARCH · ENGINEERING · EQUIPMENT

THE DORR COMPANY · ENGINEERS · STAMFORD, CONN.

Offices, Associated Companies or Representatives in the principal cities of the world

Steel

BULWARK OF FREEDOM, AND . . .

NAVIGATOR OF INDUSTRIAL MIGRATION!





BLOOMING THE INGOTS

Steel, like dough for bread, must be kneaded, rolled and worked from ingots weighing several tons down to many shapes and sizes. First in the series of such processes is the giant blooming mill of which Sheffield has installed the most modern type.

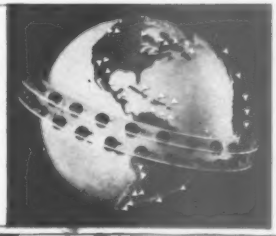
SINCE Colonial times industry has been on the move, migrating from the Northeast—West, Southwest—with iron and steel providing the means and in many cases, the motive.

West of the Mississippi and East of the Rockies, Sheffield Steel and its forebearer have successfully navigated the uncharted course of steel production since 1888. First, and still the only fully integrated steel mill operation in Mid-America, Sheffield continues to devote an ever-expanding production to a wide diversity of the particular kinds of steel products most needed in the industrial growth of the region.

Within the last ten years, the industrial growth of the region has shattered all records. So, too, has Sheffield Steel in expanding some of its facilities as much as 3½ times, and marking up an overall capacity increase, at its three plants, of over 100% as compared to 25% for the steel industry as a whole.

SHEFFIELD STEEL CORPORATION
HOUSTON KANSAS CITY TULSA
SUBSIDIARY OF ARMCO STEEL CORPORATION

SHEFFIELD MOLY-COP
COPPER-MOLYBDENUM ALLOY
Grinding Balls
USED and PROVED ALL AROUND THE WORLD



IRON AND STEEL *SCRAP* MEANS . . . . . .

MORE STEEL FOR AMERICA
More Money In Your Pocket!

GET YOURS OFF TO THE DEFENSE LINES NOW!

Toughness
Where It Counts...

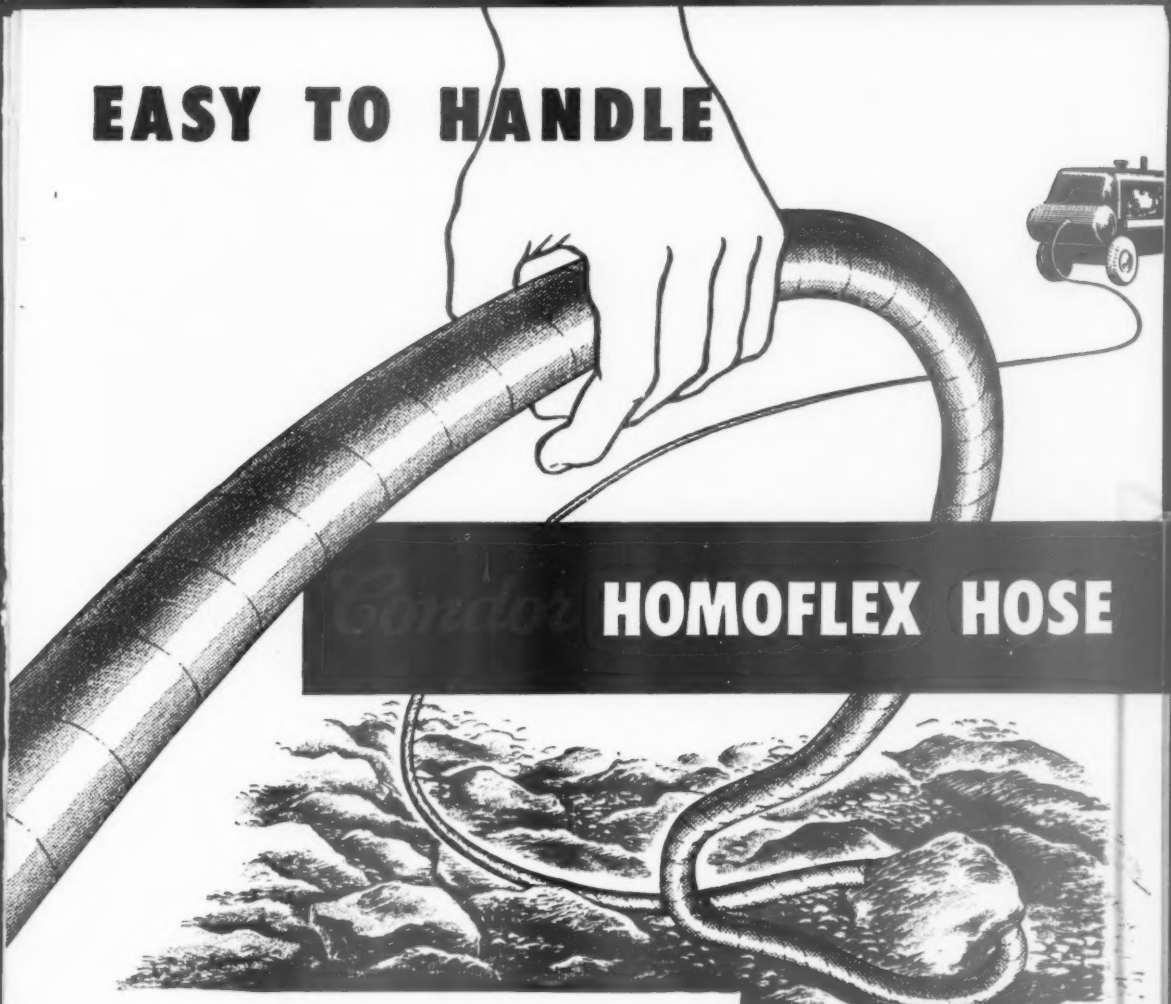
From their sturdy mountings to their tough rock dippers, Bucyrus-Erie excavators match rough quarry work with the durability that means reliable performance shift after shift. Strong, simple main machinery puts power where you want it, when you want it for hard digging service. "Full-feel" controls give you the precise response you want for greatest accuracy, least lost motion. And each machine in Bucyrus-Erie's ⅜- to 4-yard line of gasoline, diesel and single-motor electric machines features top-notch construction of laboratory controlled steels and alloys that means long-life and dependable big output. Reliability in tough going is another reason why Bucyrus-Eries are

Most Compared...
Most Preferred



BUCYRUS-ERIE COMPANY • South Milwaukee, Wisconsin

EASY TO HANDLE



Condor HOMOFLEX HOSE

"We *like* this hose." • You'll hear a lot of good words about Condor Homoflex Hose from the men on the job—and for good reasons . . . It's lighter, more flexible, and easier to handle . . . coils and uncoils without kinking • Homoflex Hose lasts longer too. It's built for strength and takes abuse in its stride • Bulletin 6879D, mailed on request, describes the unusual qualities of Homoflex for handling air, water, other fluids and gases • Unusual qualities are also engineered into other R/M Hose, V-belts, flat belting and conveyor belts. Just phone your R/M distributor.

RM

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Manufacturers of Mechanical Rubber Products • Rubber Covered Equipment • Radiator Hose • Fan Belts • Brake Linings • Brake Blocks • Clutch Facings • Packings • Asbestos Textiles • Powdered Metal Products • Abrasive and Diamond Wheels • Bowling Balls



On the job!

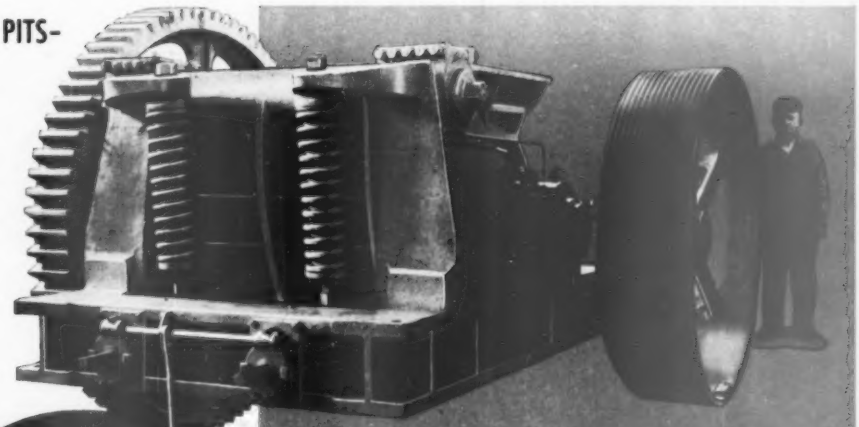
Our volunteer speakers are saving thousands of lives *today* . . . in factories and business offices . . . at neighborhood and civic centers . . . at social, fraternal and service group meetings all over this land . . . by showing people what they can do to protect themselves and their families against death from cancer.

In laboratories and hospitals, from coast to coast, our volunteer dollars are supporting hundreds of research and clinical projects that will save countless more lives *tomorrow*.

To find out what you yourself can do about cancer, or if you want us to arrange a special educational program for your neighbors, fellow-workers or friends, just telephone the American Cancer Society office nearest you or address your letter to "Cancer" in care of your local Post Office. One of our volunteer or staff workers will be on the job to help you.

American Cancer Society

FOR USE IN PITS-MINES and QUARRIES



Cut Costs 3 ways

1. The McLanahan Single Roll Rockmaster Crusher is low in cost. Few parts for construction make it less expensive to build.
2. The McLanahan Rockmaster Crusher makes possible low operating cost because continuous crushing wastes no power.
3. The McLanahan Rockmaster Crusher requires a minimum of repairs due to simplified construction.

with McLANAHAN *Single Roll*

ROCKMASTER CRUSHERS

Extremely popular in pits, mines, quarries, cement, furnace and open hearth slag plants . . . these heavy duty machines have exceptional capacities because they crush material constantly. All steel construction with cut steel gears, heavy split phosphor bronze bearings, automatic steelstrut toggle for adjustment and tramp iron protection, interchangeable and reversible crushing plate liners on improved removable bronze bushed crushing plate, heavy balanced V-grooved pulley . . . McLanahan Rockmaster Crushers are rugged and modern. They are the answer to *your* crushing problems.



Write today for Bulletin RM-505

McLANAHAN & STONE CORPORATION

Pit, Mine and Quarry Equipment Headquarters Since 1835

Hollidaysburg, Pennsylvania

Dependable Products: **Single and Double Roll—and Jaw Crushers, Crushing Plants, Reciprocating Plate and Apron Feeders, Roll Grizzlies, Conveyors, Elevators, Screens, Scrubbers, Steel Log Washers, Sand Drags, Hoists, Jigs, Dry Pans, Dryers, Scrap Bundlers, Pulleys, Gears, Bearings, Sprockets, Sheaves, Rollers, Bin Gates, Elevator Buckets, Gratings, Car Wheels, Ferrous and Bronze Castings.**

Have you ever seen a flying 'dust' man?



...You will when a Buell Engineer shows you how to reclaim the values in escaping dust and attain top over-all efficiency

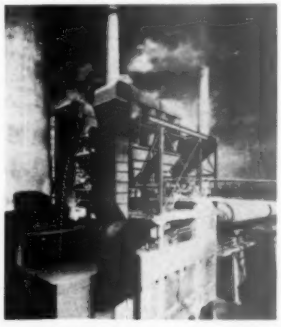
When we're called upon to boost efficiency and halt profit losses due to escaping dusts, Buell engineers plan with precision, yet move with surprising speed.

Quickly, they can pin-point a costly escape-dust problem...compute the actual loss in dollars as well as in efficiency...then, with a sureness that comes only by experience, they will design and build the dust recovery system that will most efficiently and economically do the job.

Here's why: Buell engineers—a highly skilled group of industrial "dust" men—are backed by more than 200 man-years of experience in the science of dust recovery. As a result, industry looks to Buell for leadership in methods and equipment that mean more recovered dust at less cost—for you!

For full information write today. Ask for the new, informative 'Dust Recovery' bulletin. Buell Engineering Company, Dept. 17-L, 70 Pine Street, New York 5, N. Y.

Buell van Tongeren Cyclones 'top' them all in economical kiln dust collection.



ELECTRIC CYCLONIC

HIGH-EFFICIENCY CYCLONES • ELECTRIC PRECIPITATORS
TYPE "LR" COLLECTORS • LOW DRAFT LOSS COLLECTORS
SPECIAL PURPOSE COLLECTORS • DUST HOPPER VALVES

buell

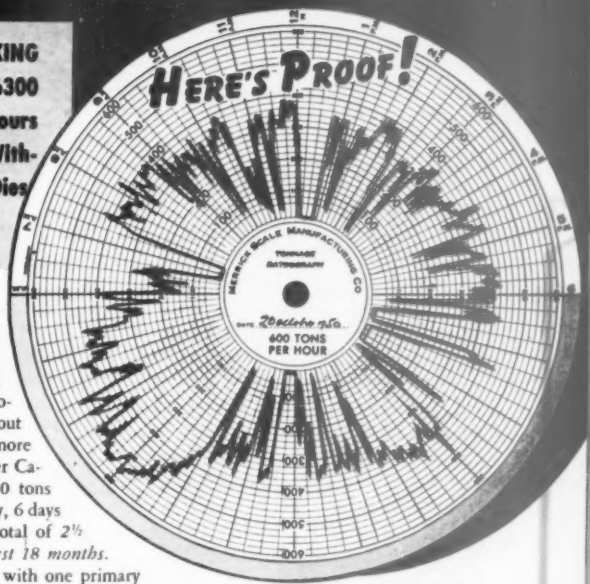
ENGINEERED EFFICIENCY IN DUST RECOVERY

Reduces **2½ MILLION TONS**

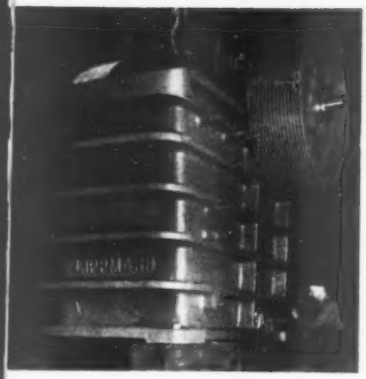
of Blast-Run Niagara Limestone to Minus 3 in. IN 18 MONTHS . . . WITH ONE CRUSHER!

Miron Brothers Fastest Growing Aggregate Producer in Canada . . .

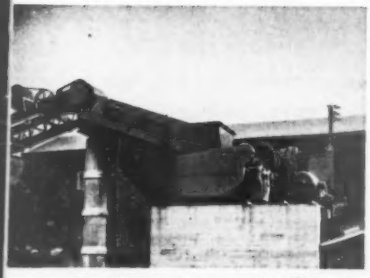
Rock-Ravenous 36 x 48 GRIZZLY KING Jaw Crusher Often Produces 6300 Tons per Day . . . Works 20 Hours a Day, 6 Days a Week Without Shutdowns! And Jaw Dies Haven't Even Been Turned!



Actual weight chart of a typical day's production, recorded by scale under discharge conveyer, is proof that Grizzly King's output reaches 560 tons per hour.



In complete Lippmann plant, Miron Bros. makes six sizes of stone — everything from ag-lime to ballast rock.



Other Lippmann equipment at Miron: two 48 x 24 roll crushers, five 5 x 12 Screen-All vibrating Screens, 591 ft. of belt conveyors with Life-Sealed Ball Bearing Idlers.

Two years ago the site of the Miron Bros. plant at Ville St. Michel, Quebec, was a farm. Today they are turning out what is believed to be more aggregate than any other Canadian producer — 300 tons per hour, 20 hours a day, 6 days a week—the amazing total of *2½ million tons in their first 18 months.*

And they're doing it with one primary in a plant that's completely Lippmann-engineered and Lippmann-built . . . . from the 36 x 48 GRIZZLY KING Jaw Crusher, the world's highest capacity overhead eccentric, through scalper, belt conveyors with Life-Sealed Ball Bearing Idlers, Screen-All Vibrating Screens with perfect-circle throw, and Roll Crushers.

They're feeding hard, blast-run Niagara Limestone up to 36 in. directly to the GRIZZLY KING, with the discharge opening set *down to 3 in.* And the crusher actually idles a good share of the time!

Amazing Capacity!

There isn't another crusher built that approaches GRIZZLY KING's capacity — extra long jaws, engineered crushing action, complete oil lubrication and alloy steel construction add up to the rock-eatingest crusher on the market today. And its low-maintenance operation is proved by the fact that Miron *hasn't even turned the jaw dies* after 2½ million tons.

You, too, can pile up extra profits with the world's lowest-cost-per-ton-crushed rock and ore machinery. And Miron is doing all this with an *investment of only $125,000* in super-capacity, low-cost Lippmann equipment.

Write today for all the facts on the complete line of Lippmann machinery for pits, mines and quarries. Follow the example of leading operators the world over who choose Lippmann above all other makes.

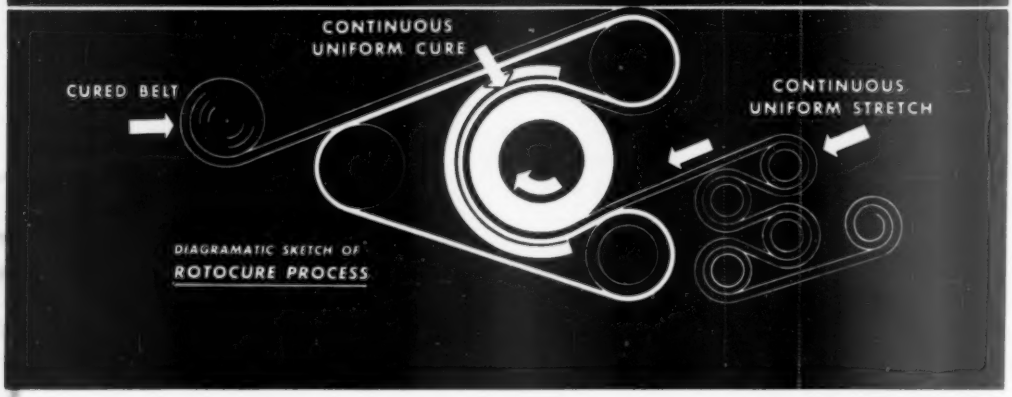
2008

WRITE FOR ALL THE FACTS on the complete Lippmann line for pits, mines and quarries:

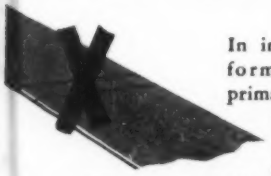
Grizzly King Jaw Crushers (Bulletin 1100), Screen-All Vibrating Screens (1200), Belt Conveyors (1400), Pulverizers (1160), Life-Sealed Ball Bearing Idlers (1410), Gyra-Gnome Secondary Crushers, Circuit Rider Self-Propelled Crushing Plants, Portable Washing Plants (1630), Apron Feeders (1450).

LEW LIPPMANN ENGINEERING WORKS
4603 W. MITCHELL STREET
MILWAUKEE 14, WISCONSIN

They're CONTINUOUSLY Right!



(No "Start and Stop" Curing--No OCS* with BWH ROTOCURED Belts)



In industry, attaining uniformity of product is a primary objective of those who buy and those who sell. *But you can't get it in conveyor belts made by conventional flat press methods!*

WHY CONVENTIONALLY-MADE BELTS ARE VULNERABLE

In flat press curing, overcured segments due to press overlaps occur every 30 to 40 feet. These segments (2" to 4" wide across the entire belt) result because vulcanization is not continuous — sections cured earlier advance less than a full press length. The weakened structure due to overcuring invites operational weaknesses and is a major reason for early belt failure.

WHY ROTOCURE ELIMINATES THIS CAUSE OF FAILURE

As the accompanying diagram shows, BWH ROTOCURED CONVEYOR BELTS are made by a continuous, endless curing process. Weak segments due to overlapping can't *happen* because the belt is in constant, uniform motion.

WHY ROTOCURE PAYS OFF IN DOLLARS AND CENTS

Inherent in the Rotocure process are these 4 specific advantages:

(1) Increased belt flex life — as much as 40%.
(2) Elimination of mechanical distortion at the press ends.
(3) Constant, uniform stretch.
(4) Uniform, abrasion-resistant covers.

These advantages are giving BWH Conveyor Belt users longer life per belt, lower belt maintenance costs and worthwhile savings per ton in materials conveyed. Ask your BWH distributor or write us direct.**

**It will pay you also to get the facts on BWH Rotocured Transmission Belts which permit operation at lower tensions.

*Overcured Sections — present every 30' to 40' in all belts made by the flat press method. Only Rotocuring (continuous, non-stop curing) eliminates this major cause of belt failure.

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.
WAREHOUSE STOCK: 111 NORTH CANAL ST., CHICAGO, ILLINOIS

BWH
DEPENDABLE RUGGEDNESS

Cut Cooling Costs

these 3 Ways

1. CUTS ROTARY KILN FUEL COSTS

Air-Quenching grate cooler actually returns 75% of sensible heat in clinker back to kiln as secondary combustion air. Clinker is cooled quickly, to a temperature where handling is no problem, by means of cooling air coming up through the relatively thin bed of hot material on grate.

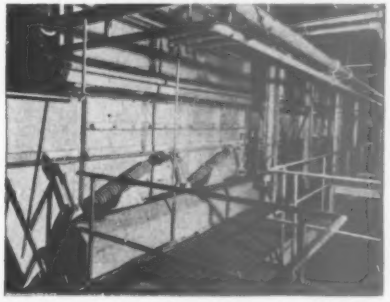
2. CUTS CLINKER GRINDING COSTS

Air-quenched clinker is easier to grind — capacities of clinker grinding mills handling hard-to-grind clinker have been increased as much as 10% with the installation of an air-quenching grate cooler. Rapid cooling also helps nullify the detrimental effects of magnesia in clinker.

3. CUTS MAINTENANCE COSTS

Reciprocating motion of grate is carried on flexible rubber bushings and springs. No wearing parts and no slippage. Clinker does not slide on grate, it hops, gently and steadily. Lubrication is negligible, only four grease fittings on entire cooler. Maintenance cost runs as low as 1/10 cent per barrel.

COOLS 100 BARRELS AN HOUR FROM 2500° TO 90° F.
In the modern plant of Dewey Portland Cement Co., Davenport, Iowa, this 4½ x 70 ft Allis-Chalmers air-quenching grate cooler cools 100 barrels of cement clinker per hour from 2500° F. to approximately 90° F. It's one of three Allis-Chalmers grate coolers installed here.



Save on Installation Cost, Too!

The air-quenching grate cooler comes as a complete unit, fits into existing plants readily because it operates horizontally. Installation costs are 10 to 30 percent less than the cost of installing any other type of cooler! Get more facts from the Allis-Chalmers representative in your area, or write for Rotary Kiln Bulletin 07B6368A. Allis-Chalmers, Milwaukee 1, Wisconsin.

Pulverator is an Allis-Chalmers trademark.

ALLIS-CHALMERS

A-3391

Sales Offices in Principal Cities in the U. S. A. Distributors Throughout the World.

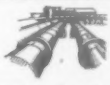

Pulverators

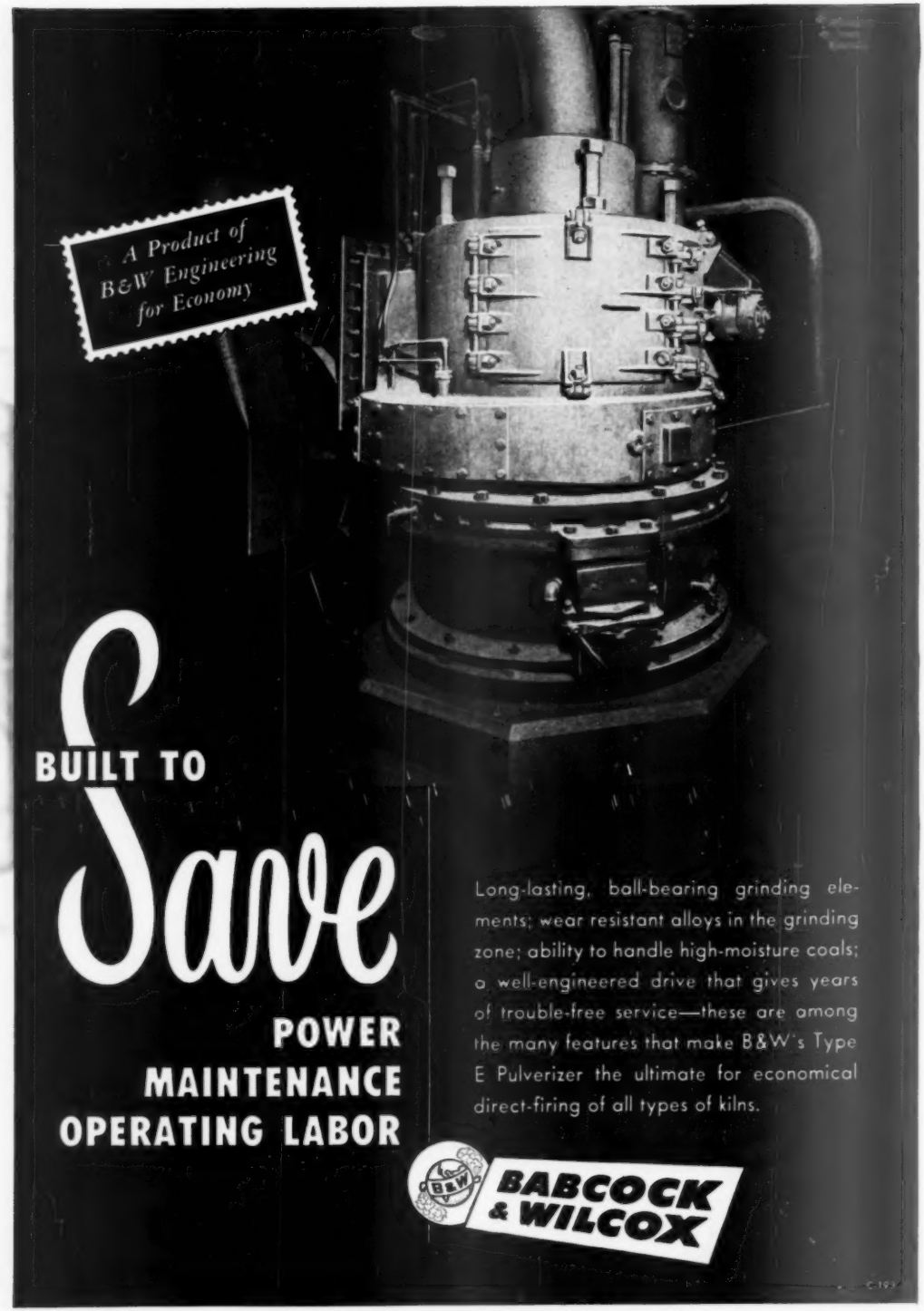

Vibrating Screens


Jaw Crushers


Grinding Mills


Gyratory Crushers

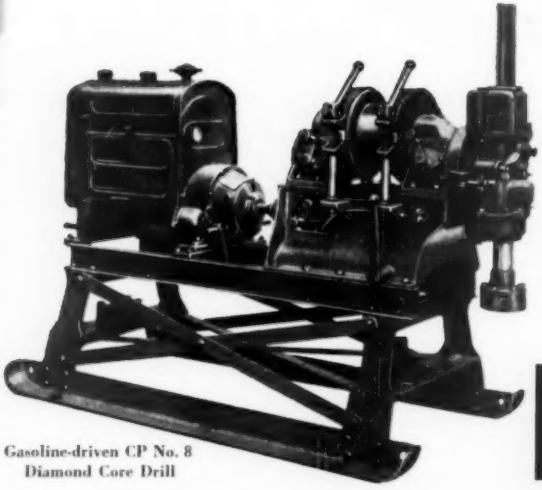

Kilns, Coolers, Dryers


A Product of
B&W Engineering
for Economy
BUILT TO
Save
POWER
MAINTENANCE
OPERATING LABOR
Long-lasting, ball-bearing grinding elements; wear resistant alloys in the grinding zone; ability to handle high-moisture coals; a well-engineered drive that gives years of trouble-free service—these are among the many features that make B&W's Type E Pulverizer the ultimate for economical direct-firing of all types of kilns.
B&W
BABCOCK & WILCOX


May
the true
meaning of
Christmas
become the
pattern for our
lives . . . for yours
—and ours, and for
people's everywhere.
That is the Holiday
wish from all of us.

Bemis

FOR EXPLORATORY DRILLING



Gasoline-driven CP No. 8
Diamond Core Drill

For exploring quarry sites or possible extensions of present sites, the gasoline-driven CP No. 8 DIAMOND CORE DRILL is ideal. Ruggedly built, skid mounted, readily moved from hole to hole under its own power.

Drilling at the continuous high speed made possible by bortz bits, the CP No. 8 gives exceptional performance with remarkably low maintenance. With E-EX Fittings it has a capacity of 900 feet.

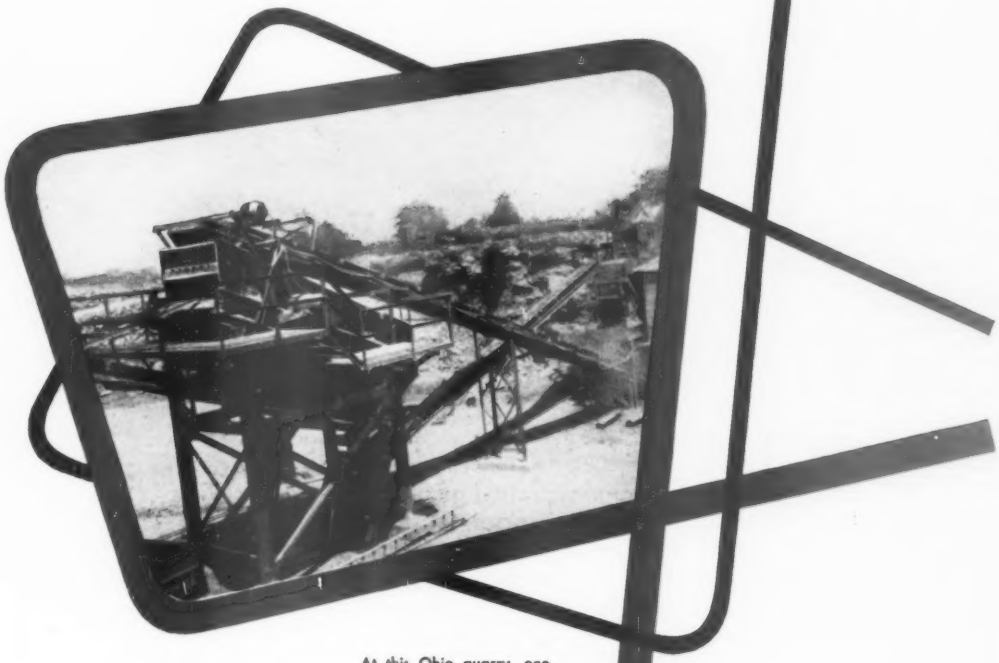
For still deeper drilling, the CP No. 15 provides a capacity of 1750 feet. Both the No. 8 and No. 15 are also available with Diesel-drive.

Write for Bulletin No. 313

CHICAGO PNEUMATIC TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

SIMPLICITY 5'x12' TWO-DECK SCREEN KEEPS AGGREGATE PRODUCTION HUMMING AT AN OHIO QUARRY



At this Ohio quarry, one Simplicity double deck screen is sizing ballast and filler stone at feed rate of 240 tons an hour. It screens out sizes up to 2" on the top deck, sizes up to 1" on the lower deck and returns larger pieces to the crusher for further processing. Like owners and operators everywhere, the operators at this Ohio quarry have discovered that Simplicity Screens speed up production and keep maintenance costs down. Simplicity gives more screening area. This 5' x 12' screen gives a full 60 sq. ft. of screening surface. Simplicity's famous gyrating action assures fast, accurate sizing. And Simplicity's simplified power and operating mechanism keeps maintenance costs down, makes servicing easier.

Simplicity Screens can help cut costs and speed up production in your aggregate operations. Write us for full information or consult a Simplicity sales engineer. There's one near you.

T02

- **Sales representatives in all parts of the U. S. A.**
- **FOR CANADA:** Canadian Bridge Engineering Company, Ltd., Walkerville, Ontario
- **FOR EXPORT:** Brown and Sites, 50 Church Street, New York 7, N.Y.

Simplicity
TRADE MARK REGISTERED
ENGINEERING COMPANY • DURAND, MICHIGAN

ATTENTION AGSTONE PRODUCERS!

Plan to attend the First Industrywide Meeting of Agricultural Limestone Producers. With the merging of the Agricultural Limestone Institute and the National Agricultural Limestone Association, the National Agricultural Limestone Institute will hold its first meeting.

JANUARY 15, 16, & 17
HOTEL STATLER
WASHINGTON, D. C.

Attend to hear nationally-known speakers including Secretary of Agriculture, Charles F. Brannan — to take part in the panel discussion on operating problems and promotional activities — to meet producers from other sections of the country — to help formulate Industrywide policies for the coming year — to learn the recent important developments on Percentage Depletion (this alone will be worth many times the cost of the trip).

Bring the ladies — special program of sightseeing and shopping tours in the Nation's Capitol arranged for them.

Enjoy yourselves at Wednesday evening's informal Cocktail-Buffet Supper-Dance.

Meet Senators and Representatives and Governmental guests at the Reception and Banquet, Thursday evening (January 17).

Write for Program or Reservations to

NATIONAL AGRICULTURAL LIMESTONE INSTITUTE

619 F STREET, N.W. **WASHINGTON 4, D. C.**

No ONE chain serves every purpose

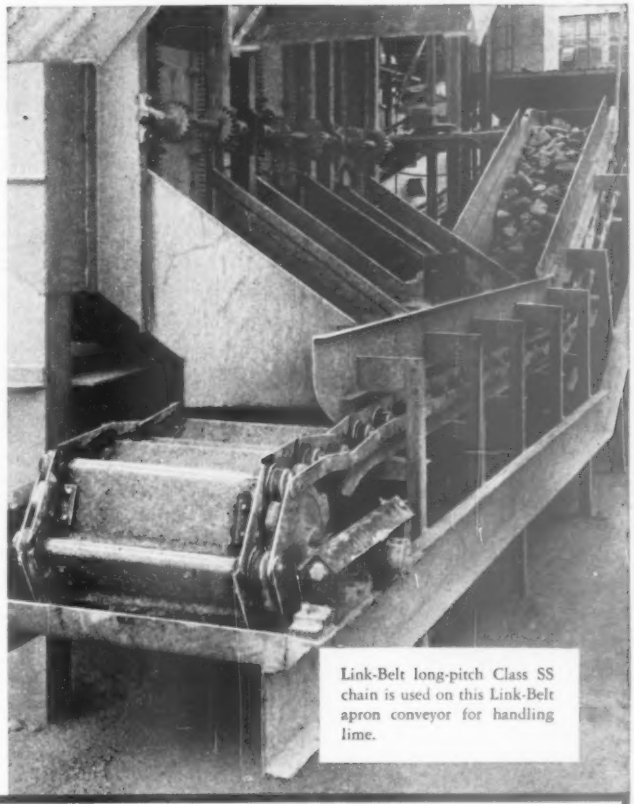
LINK-BELT offers a SPECIFIC chain ... to match your SPECIALIZED needs

There's just *one* type of chain that *best* meets the requirements of any given job. And no "general purpose" chain can do it as well. From the world's most complete chain line, Link-Belt engineers can recommend the *right* chain for your requirements. Large or small, Link-Belt builds them all.

Get longer life!

Remember, too — when you see a chain with the Link-Belt trademark, you can be sure it's made to the highest standards. Link-Belt's modern plant facilities assure greater refinements of manufacture. Exact control of materials and processes gives increased uniformity . . . longer chain life.

12.325-D



Link-Belt long-pitch Class SS chain is used on this Link-Belt apron conveyor for handling lime.

TYPICAL CHAINS from the COMPLETE LINK-BELT line



Class SS bushed roller chain with offset sidebars —for heavy drive service at moderate speeds.



Class SS bushed roller chain with straight sidebars —for practically any conveying or elevating service.



Class 800 ley bushed chain—for heavy duty, severely abrasive conveying and elevating.



Class C combination chain — popular, durable, low cost design for elevators, conveyors.

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, factory branch stores and distributors in principal cities.

LINK-BELT

CHAINS AND SPROCKETS

This Department Is Never Busy

...but Seco VIBRATING SCREENS ARE!



Long Life Performance Means *Profitable Screening* for SECO Users

If you have Seco vibrating screens on your job . . . it's good to know that you can get *quick service* on any parts replacements you may ever require. That's part of Seco's service policy . . . another of the reasons why you put your confidence in the Seco organization.

BUT HERE'S SOMETHING MORE IMPORTANT!

Seco vibrating screens are *built to endure.* The smooth, balanced performance of patented Seco vibrating screens pays off in long life . . . and a holiday from excessive maintenance worries. *It's a proven fact!* Thousands of busy Seco vibrating screens can't keep our parts department busy.

SECO

TRUE CIRCULAR ACTION

VIBRATING SCREENS

WHAT'S AHEAD? Check your screening requirements now.

PLAY SAFE! REPLACE OR ENLARGE WITH
Performance-Proven
SECO VIBRATING SCREENS

made only by

SCREEN EQUIPMENT CO., INC.
1750 WALDEN AVENUE
BUFFALO 25, NEW YORK
In Canada: United Steel Corp., Toronto, Ontario



ANY equipment parts that are subject to rough impact or severe abrasion are likely applications for *Wear-Arc* hard facing. Write for Bulletin 5651 for application information and welding procedures.







Alloy Rods Co.

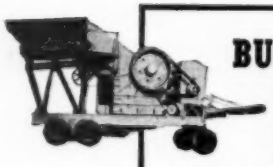
ALLOY RODS COMPANY

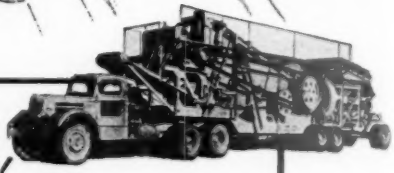
No Finer Electrodes Made . . . Anywhere

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AR-5

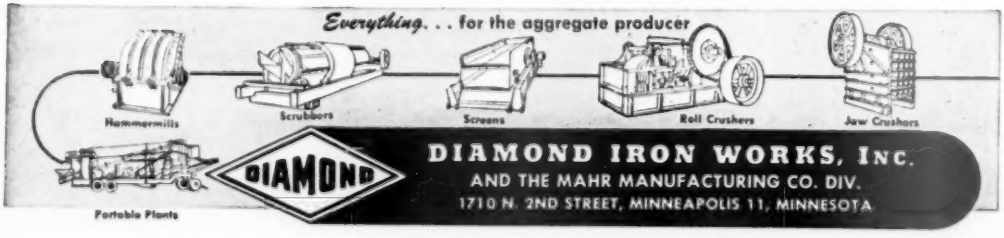






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Diamond equipment shortens material flow, jumps output, gives you more for your money. Crushing, screening, washing and loading of rock, gravel, aglime and concrete aggregates are best done by Diamond. Before you specify or buy, see your Diamond Distributor. Or write for illustrated literature.



MORE than a family resemblance



Regardless of what size Oliver Industrial Wheel Tractor and Ware Loader you buy . . . "66", "77", "88" . . . you get the identical superior design and performance features in each.

The smaller tractor-loaders are not built down to a price level . . . they are built up to the same quality standards as the larger models.

In the tractors, you get the famous Oliver *plus* power and easy maneuverability that get you in and out of the rough spots . . . *fast!*

In the loaders, you get the same top features in each . . . hydraulically controlled bucket for greater "breaking out" action—full bucket loads . . . hydraulically controlled discharge—easily and gently, fast or slow . . . mid-section pivot of the loader arms for longer reach of dumping position and correct weight distribution on tractor frames . . . simple, rugged design that eliminates unneeded dead weight . . . shock loads absorbed by hydraulic rams for longer tractor and loader life—lower maintenance.

Your Oliver Industrial Distributor will be happy to show you what the "more than a family resemblance" in Oliver-Ware Tractor Loaders means to you in lower cost operation. And see the Oliver color film "Task Force on Wheels."



THE OLIVER CORPORATION

Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio

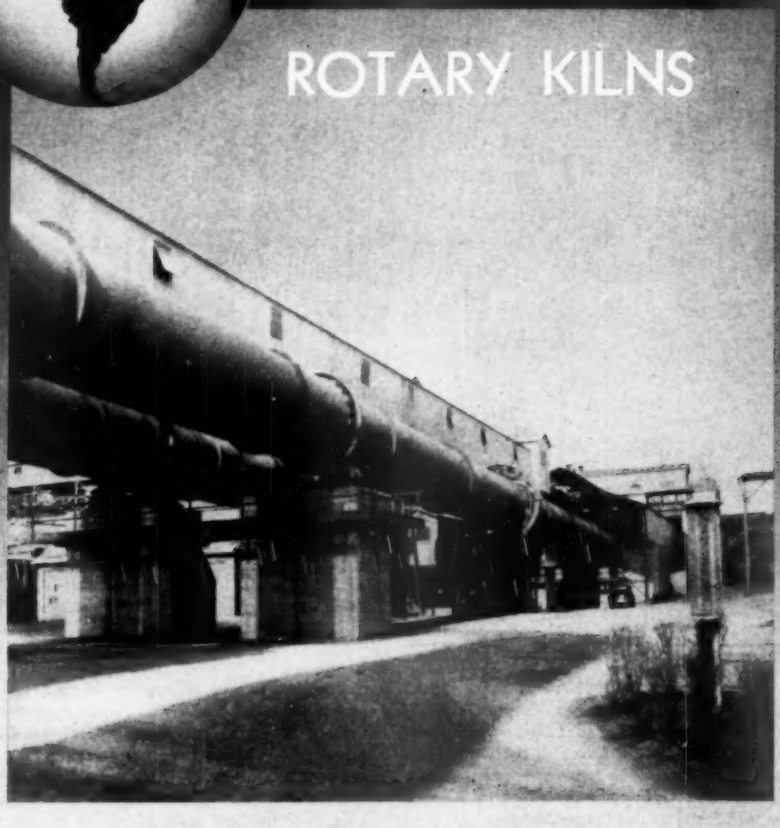
A complete line of industrial wheel and crawler tractors





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"WE HEAR..."

December, 1951

At an emergency conference on iron and steel scrap salvage, held recently in Washington, it was declared that scrap collections may be the key to mobilization and may even mean the difference between victory and defeat. Steel production is being seriously hampered by the lack of scrap. It was stated that 36,000,000 tons of iron and steel scrap are needed right now. Steel production requirements in 1950 amounted to 96,700,000 tons, with scrap consumption at 29,500,000 tons; steel production requirements for 1951--110,000,000 tons, scrap consumption at 36,000,000 tons; and for 1952, steel requirements will amount to 117,500,000 tons, which will mean increased requirements for scrap. Some producers of rock products have considerable "useless" scrap around that would be welcomed by the steel industry.

* * * * * * * * * *

An employe of an eastern cement company was suffocated in a cement slide while clearing out a bin in the packhouse. The employe was hoeing cement from the sides of the bin toward a chute when a slide occurred. While another employe was trying to rescue him by means of a safety belt and rope, a second slide occurred. He was finally taken out through a small chute, but all efforts to revive him were futile. This suggests that extra precautions should always be taken whenever workers are required to enter bins.

* * * * * * * * * *

New and important uses for metallic calcium are being discovered, according to a report in Chemical Engineering. One new important use is its replacement of many critical metals. A new long-life storage battery, recently put into commercial use by Bell Telephone Laboratories, uses 0.5 percent calcium instead of 12 percent antimony, now scarce. During World War II about 500,000 lb. of metallic calcium were produced and converted into calcium hydride, which reacts with water to give calcium hydroxide and hydrogen. This hydrogen was used by the government to inflate weather balloons. Metallic calcium, about 99 percent pure, is now being produced by New England Lime Co., Canaan, Conn., for the government for this purpose. Another company to produce metallic calcium is White Metal Rolling & Stamping Co., Brooklyn, N. Y.

* * * * * * * * * *

Recent reports have indicated an increase in new construction activity by the railroads. According to a joint statement by the Commerce and Labor departments, railroad construction activity in August, 1951, amounted to $34,000,000, compared with $29,000,000 in August, 1950, and $33,000,000 in July of this year. In the first eight months of 1951, new construction activity by the railroads totaled $230,000,000, compared with $194,000,000 for the same period of 1950.

* * * * * * * * * *

Engineering construction of all classes for the first 43 weeks of 1951 totaled $11,751,415,000, as was reported by Engineering News-Record. This compares with a total of $9,914,942,000 for the corresponding period of 1950.

* * * * * * * * * *

The State of Nevada is considering the sale of the Basic Magnesium Industries plant near Hoover Dam to four major firms who now lease the facilities, as was reported in Chemical and Engineering News. The companies have made an offer of $24,000,000 and propose the formation of a corporation to negotiate the purchase. This offer is the same as the price paid by Nevada to the federal government for the plant, a balance of $18,000,000 being owed at the present time. The federal government originally spent $240,000,000 in building the facilities.

WE HEAR

An item on these pages in the September issue of ROCK PRODUCTS, told how a worker in a concrete block plant was killed and another lost both feet while cleaning the inside of a concrete mixer. A new employe had pressed the wrong button and set the mixer blades turning. A reader has submitted a solution for preventing such an accident--to pad lock the motor switch and give the key to the man inside.

* * * * * * * * * *

The American Road Builders Association recently announced that, despite the tightening of controls on highway building materials and the increasing scarcity of equipment and repair parts, national highway construction expenditures showed a substantial increase for the first five months of 1951, over the corresponding period of 1950. For the 1951 period, construction expenditures totaled $645,000,000, compared with $597,000,000 for the 1950 period.

* * * * * * * * * *

The American Iron and Steel Institute has reported that the steel industry set new production records for September, 1951, for the third quarter and for the first nine months of 1951. The September output totaled 8,644,000 tons, compared with 8,204,997 tons produced in September, 1950. Production for the third quarter of 1951 totaled 25,056,839 tons, which was 1,526,746 tons higher than in the third quarter of 1950, but 535,141 tons lower than the second quarter of 1951. Production for the first nine months of 1951 amounted to 78,328,742 tons, an increase of 9.2 percent over the same period in 1950, and well above the total for all of 1949, which was 77,900,000 tons.

* * * * * * * * * *

A slag-crushing machine, which produces a fine road-surfacing material from slag, has been developed in France. The material contains a proportion of iron and coal dust which, when mixed with a liquid binding agent, can be spread on a road surface where it hardens into an "iron cement." It is claimed that the "iron cement" gives a sandpaper surface that virtually is indestructible and on which cars do not skid in wet weather.

* * * * * * * * * *

The 9-month, 1951 total of construction awards in the 37 states east of the Rockies reached $12,533,605,000, or 13 percent higher than the total for the comparable period in 1950. However, the downtrend in dollar volume of construction contracts in August continued its pattern during September, according to an F. W. Dodge Corp. report. The September total of $1,082,855,000 was a decrease of 14 percent from August and a drop of 16 percent from September, 1950. Nonresidential awards in September were $404,462,000, or 15 percent lower than in August and 19 percent below September, 1950. Residential contracts at $479,716,000 were 15 percent less than in August and 13 percent behind the September, 1950, total. Public and private works and utilities were 9 percent lower than in August and 17 percent lower than in September, 1950.

* * * * * * * * * *

An expanded research effort to develop practical methods of obtaining manganese from low grade ores has been announced by a Bureau of Mines group in Minneapolis, according to Chemical and Engineering News. Ore deposits on the Cuyuna iron range, estimated at 500,000,000 tons, are considered among the largest reserves in the U.S. but contain only 2-10 percent manganese. At present, the American steel industry imports about 90 percent of its manganese requirements--principally from India, Union of South Africa and Brazil. Shipments from Russia, world's largest producer, now seem to be a thing of the past. The steel industry requires about 13 lb. of manganese per ton of steel produced.

* * * * * * * * * *

Metal shortages are going to get a lot worse before they get better, according to U.S. News & World Report. Carbon steel requirements for the first quarter of 1952 are 156 percent of supply; structural shapes, 205 percent of supply; plates, 180 percent; alloy steel, 160 percent; stainless steel, 170 percent. Aluminum demand is 177 percent of supply, with copper demand even higher. Those are requirements forwarded to defense agencies under the Controlled Materials Plan.

THE EDITORS



Loading stone from the quarry, this GM Diesel-powered 1½-yard Koehring handles 150 tons an hour on less than 4½ gallons of fuel.



20% HIGHER PRODUCTION at ⅓ the fuel cost

Cowan Stone Company, Cowan, Tennessee, wanted another make of Diesel when they bought their Koehring 605 shovel in 1948. But it was readily available with a GM Diesel engine, so they took it.

And when they recently converted a 21-year-old 1¼-yard shovel from gasoline to Diesel power, what engine do you think they installed? Another GM Diesel, of course!

With its smooth, steady flow of power, this veteran machine now stock-piles 125 yards an hour—approximately 20% more than it did before—and uses only 3 gallons of Diesel fuel per hour as compared to 7 gallons of gas.

Figure the savings in terms of your own operation. Then call in your nearby GM Diesel distributor. Ask him to show you how simple and economical it is to convert to this modern 2-cycle Diesel power.

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES...Up to 275 H. P. **DETROIT 28, MICHIGAN** MULTIPLE UNITS...Up to 800 H. P.

GENERAL MOTORS

GM GENERAL MOTORS DIESEL POWER

DIESEL BRAWN WITHOUT THE BULK

Barber-

840 BITUMINOUS PAVING PLANT



B-G 840 Paving Plant, showing use of bulkhead feed with two-gate feeder for proportioning sand and gravel. 2, 3 or 4 aggregates may be blended in this manner.

PRACTICAL . . . PROFITABLE

UP TO 40 T. P. H.

The capacity range of this B-G Paving Plant has proved to be the most practical for a broad range of users. Output is high enough to supply materials for average-sized new construction and resurfacing jobs—investment is low enough to assure profitable operation at minimum capacities, or for intermittent operation.

ALL TYPES OF MIXES

Bituminous mixes of all types are produced at lowest cost with this B-G Plant. This includes the full range—all temperatures, all gradations and all binders. For "high-type" mixes, the aggregates are blended at the feeding end. Quality and uniformity are consistently high.

TRULY PORTABLE

Each basic unit of this plant—Mixer and Dryer-Dust Collector—is mounted complete on its own trailer-type pneumatic-tired chassis. Built-in hot and cold elevators and dryer stack fold down for transport. There is a minimum of dismantling—the plant can be moved and readied for work in new locations in a few hours' time.

EASIEST TO ERECT

No special erection equipment is needed to set up a B-G Paving Plant. No excavation or footings required. Units are spotted in place by truck, adjustable jacklegs are lowered to ground level, and the plant is ready for operation once the required auxiliary equipment is in place.

LOW-COST MAINTENANCE

The B-G Model 840 Paving Plant is easy to maintain. All moving parts are quickly accessible for inspection and adjustment. B-G Distributors offer fast emergency parts service, and are staffed with factory-trained experts to help you keep your B-G Paving Plant at top operating efficiency.

AUTOMATIC PROPORTIONING

Simple to understand and to operate, the B-G Paving Plant eliminates the human element in producing a consistently uniform mix. Once the bitumen and aggregate proportions have been set, they cannot vary as the positive displacement pump and aggregate apron feeder are positively interlocked. Proportioning is continuous, automatic and accurate.

see your B-G distributor

Greene

PROVED . . . ALL OVER THE WORLD

All over the world there are primary and secondary roads, boulevards, streets, airports, parking areas, recreational and training areas, rail heads and docks paved with all classes of material mixed in this B-G Paving Plant.

Its economy has been proved by hundreds of cost-conscious contractors, cities, counties and states.

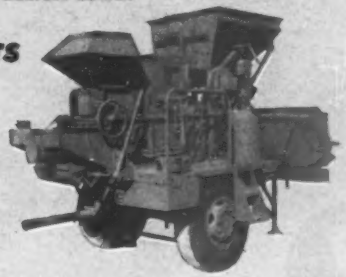
Its portability, ease of erection and uniform high quality production are factors favored by all operators—including the United States Armed Forces.

There is a need for bituminous surfacing materials in your area, and the B-G Paving Plant might well be the answer. See your B-G Distributor or write to the address below.

TWO BASIC VERSATILE PORTABLE UNITS

THE 840 MIXER

Compact, portable (note truck-towing hitch), this mixer incorporates an aggregate hopper with apron feeder and calibrated gate for accurate, measured control of flow of aggregates to pugmill. Pugmill is twinshaft type. Bitumen is supplied from insulated tank by positive displacement asphalt metering pump. Pump and apron feeder are positively interlocked for unvarying proportioning. Tank is heated by a torch-type distillate burner, eliminating need for boiler. Inclined belt conveyor elevates mixed material to trucks. All components, including power unit, mounted on pneumatic-tired chassis, equipped with jacklegs for quick erection.



Capacity of 840 Mixer: up to 40 tons per hour when used with Model 839 Dryer; up to 40 tons per hour when used alone to produce cold-mix materials.

THE 839 DRYER

Equally compact and portable design is evident in this unit which incorporates drying drum, hot and cold aggregate elevators, low pressure air atomizing burner, fuel pump, blower, exhaust fan and stack as well as power unit. Twin cyclone dust collector also may be mounted on same chassis. None of these components need be removed or dismantled for travel.



Capacity of 839 Dryer: up to 40 tons per hour. A similar Dryer with smaller capacity (10 to 25 tons per hour) is available. Either may be used with the 840 Mixer.

B-G BITUMINOUS PLANTS AND ACCESSORIES

The Barber-Greene line of bituminous mixing plants includes complete equipment for mixing up to 150 tons per hour of all classes of mixes. Units and accessories may be purchased individually for operation with other than B-G equipment.

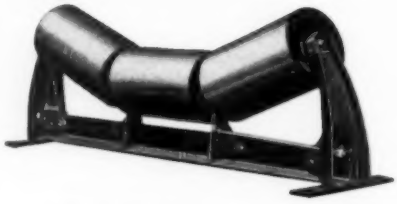
In the complete B-G line, you will find the combination of Hoppers, Apron Feeders, Portable Conveyors, Elevators, transfer pumps, storage tanks, piping and other accessory equipment required for your particular plant setup. Ask your factory-trained B-G representative for full authoritative information.

213-1

OR WRITE BARBER-GREENE COMPANY, AURORA, ILLINOIS, U. S. A.

2 ways L-B Belt Conveyors
cost you less in the long run

1 LINK-BELT Idlers require minimum lubrication and adjustment



BY MINIMIZING maintenance . . . holding "down-time" to a new low . . . reducing power requirements — Link-Belt Roller Bearing Idlers save you money.

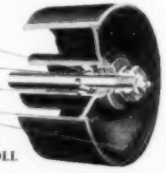
And, because of standardized design, Link-Belt gives you the famous "100" Idler or the heavy-duty "200" Idler at a cost lower than you'd expect. You can choose from the full Link-Belt line of troughing, impact-cushioning, belt training and flat belt idlers in a wide range of roll diameters and belt widths. A complete line to meet any requirement.

Grease-in, dirt-out, cartridge type unit seal preserves lubricant. No springs, no loose parts, no sliding metal-to-metal contact.

Large grease reservoir prolongs lubrication intervals.

Precision roller bearings maintain alignment.

Concentrically counterbored and journaled full-length central tube and counterbored roll shell are continuously welded to dished heads to maintain balance and bearing alignment.



CUTAWAY OF "100" ROLL

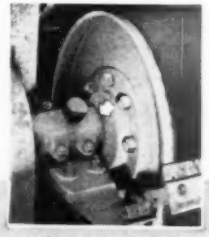
2 LINK-BELT Welded Steel Pulleys minimize shaft deflection



MODERN Link-Belt welded steel design gives you lower maintenance and longer pulley life in more ways than one. Water- and dust-tight construction preserves balance, halts corrosion. Removable hubs — key-seated in line with two set-screws — are interchangeable with many other shaft sizes.

And for reducing shaft deflection (see below), you can't possibly get better protection than with Link-Belt Welded Steel Pulleys.

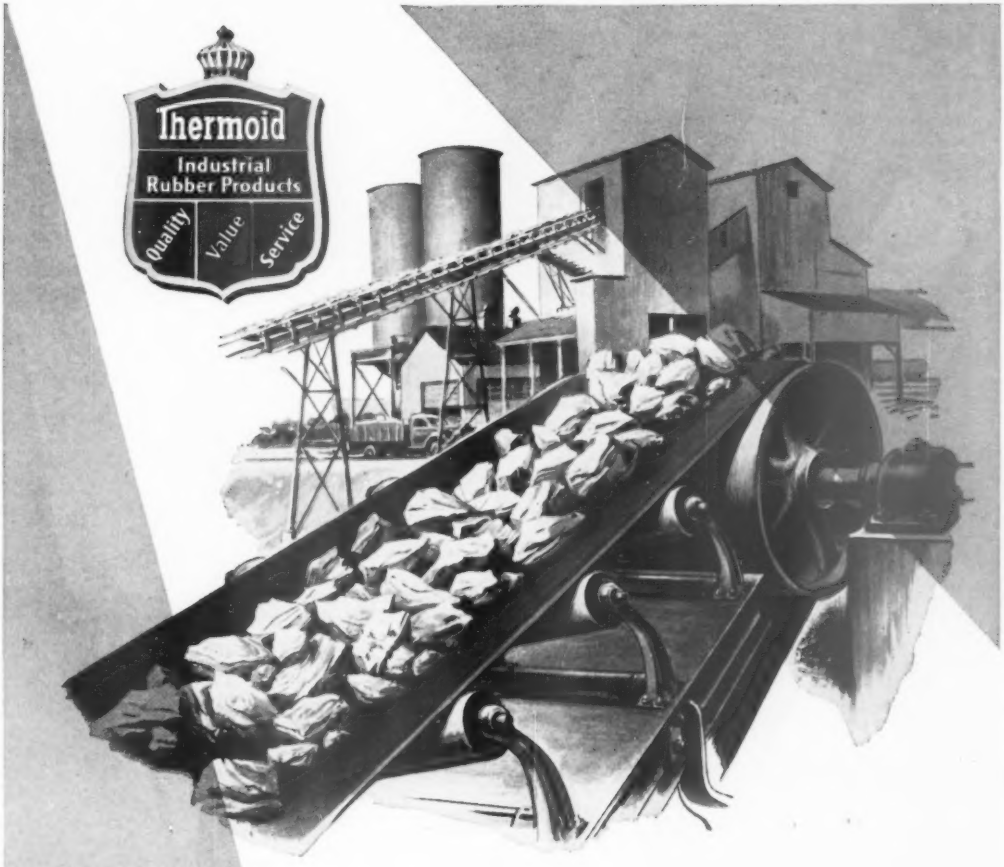
Since shaft bending moment increases in proportion to the distance between shaft bearing and pulley hub, it's easy to see why Link-Belt Welded Steel Pulleys are your best bet. Note how the bearing support and hub of the pulley are mounted with minimum clearance. That's possible because Link-Belt hubs are flush with the pulley face.



BELT CONVEYORS

LINK-BELT

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities. 52.535



"Whatever Your Conveyor Belting Problem . . . *Thermoid Has The Answer*"

Whatever the job—whatever the nature of the materials to be **handled—heavy or light,** soft or abrasive, hot or cold, wet or dry, **uniform or non-uniform in** size—there is a Thermoid belt built to **do the job at the lowest cost** per ton of material handled.

Thermoid belts are made with an extra margin of endurance. You will find they stay on the job long after ordinary belts fail. With Thermoid, you will have fewer delays due to belt breakage or premature wear. Your Thermoid distributor will be glad to help you with your requirements.

Here's The Book That Will Answer Many Of Your Questions



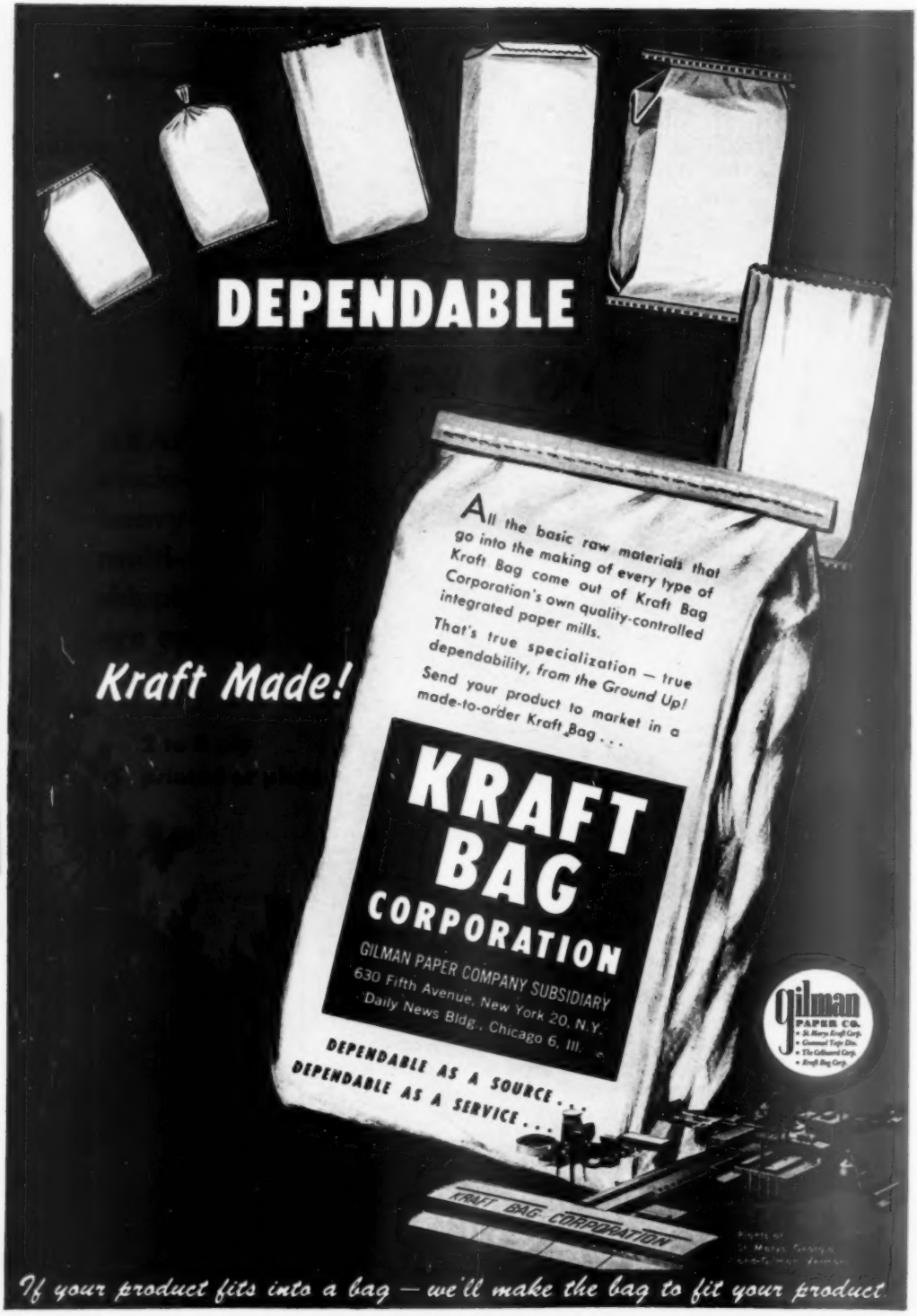
Drop us a line for your free copy of Book No. 3679. It is a handy reference guide, concise and complete. 16 pages of valuable charts, tables and graphs tell how to select the right conveyor or elevator belt for the materials to be handled . . . how to determine capacities, speeds, weights and number of plies.

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All the basic raw materials that go into the making of every type of Kraft Bag come out of Kraft Bag Corporation's own quality-controlled integrated paper mills.
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★ ★ ★ Editor's Page

A Call to Action for Agricultural Limestone Producers!

IT IS A GREAT FORWARD step for the agricultural limestone industry that the Agricultural Limestone Institute and the National Agricultural Limestone Association have joined forces to form a single national association. National Agricultural Limestone Institute, as it has been named, is independent of any other organization and will be officially formed at its first annual convention.

Without the accomplishments of the two independent national associations, the industry would never have developed to the degree it has. Many established producers would have gone bankrupt and others never would have entered the industry at all. Without the pressure by both groups for government appropriations in support of soil conservation practices and without the dissemination of scientific and sales promotion literature fostered through their efforts, the tonnage of agricultural limestone spread on the nation's farms in recent years would have been insignificant. Our agriculture by the same token would have deteriorated greatly in the face of demands for greater production of farm products.

That the two independent associations could contribute so much for the industry and the public interest was due, in part, to the intense competition between them. Each was seeking to do the best possible job for the industry to attract more members so that greatly expanded activities might be undertaken.

In doing so, both suffered because neither was successful in gaining merited financial support. Having competitive national associations naturally raised misgivings in the minds of some producers, who have been content to sit on the fence; and, like in any industry, a great number who have given no support are in business today only because others did.

The agricultural limestone industry is unique among all the rock products industries. There is still a "newness" to it in its modern concepts and its products are not just going to be bought because there is a need for them like in buying aggregates or cement for a structure. The farmer, who has always been able to raise certain quantities of crops from his soil, still must be convinced that more and better quality products can be raised from that same soil, through liming, and at a profit to him.

Agronomists are developing facts which prove that intelligent liming practices pay handsome dividends and they also point to the great threat to our agriculture and to our very civilization bebause the job of liming being done annually is but a fraction of the minimum necessary requirement. The public welfare is at stake and the industry must assume a share of the responsibility.

Those in the industry who have contributed little or nothing financially to its development thus far, should give serious consideration to membership in the new National Agricultural Limestone Institute. They must realize that farmers generally have not yet been nearly enough sold on liming materials to pay cash for them, and they must anticipate greater sales resistance from the farmer as he is required, under the government program, to pay an increasing share out-of-pocket.

What guarantee is there that the federal government will continue payments at all under the soil conservation program or that appropriations for the purpose will not be drastically cut? Is the soil conservation program likely to be continued if there be political changes in the federal government unless the industry anticipates the threat and acts to protect the industry? Will the depletion allowances granted the industry as the result of association activity, with its great financial rewards to individual producers, be carried on automatically without continuing effort to keep them in the tax laws? These questions dictate the need for strong group action.

Since the public interest is at stake, it is absolutely essential that the use of liming materials be greatly extended by any and all means! A greatly accelerated sales program directed to the farmer is a must for the long pull and, insofar as government aid is considered essential to do the job, legislative activity by the industry collectively is necessary. To accomplish the latter objective, the public—and not just the farmer—must be sold on the vital need for liming the nation's farmlands. The industry has a big and continuing job of public relations to do.

It is gratifying that the new association is giving equal consideration to a legislative program and to sales promotion for the coming year in the allocation of its funds and that it has emphasized in its bylaws that it is its purpose ". . . to promote and advance the general welfare of the agricultural limestone industry *consistent with the public interest . . .*"

The need for a big turn-out at the first annual convention is strongly indicated. A course of action vital to all producers will be charted on that occasion. The time is January 15-17, 1952; the place, the Statler Hotel, Washington, D. C.

Bror Nordberg



New Dry Rolling Toggle

✓Outlasts Conventional Toggles
✓Reduces Maintenance Costs

Dry rolling toggle was developed by Allis-Chalmers for A-1 jaw crushers ...can be installed on other jaw crushers now in use.

The Allis-Chalmers representative in your area will be glad to give you complete facts about A-1 jaw crushers. Allis-Chalmers, Milwaukee 1, Wisconsin.

NO LUBRICATION True rolling action of toggle ends and seats requires no lubrication. No oil lines or lubricant needed. No oil drip from toggles to pit below crusher. Increased safety and cleanliness!

ROLLING ACTION Replaces friction-producing sliding action. Toggle bearings are cold even after 16 hours of tough crushing!

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LASTS LONGER Improved toggle is safety shear type. Only inexpensive rivets shear off when unbreakable materials enter the crushing chamber. No need to replace the whole toggle! Rivets can be replaced easily in the field.

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Rocky's NOTES

Nathan C. Rockwood

Surface Chemistry of Aggregates

SOME READERS say they do not understand the references to colloid chemistry of cement paste and aggregates, but nevertheless find these articles interesting and suggestive; for them we write! We note, too, a few with technical minds who more or less disapprove, believing one should stick to his own field or specialty, leaving to other specialists their particular fields. Such minds apparently don't want to extend their knowledge to colloid or structural chemistry; or perhaps consider it unethical for any layman to trespass on ground claimed exclusively by another group of scientists.

To us this is a mistake, because there is real need for science generalizers, who have at least some understanding of the various branches of applied science and who are able to see or at least imagine broader applications than the few specialists in those sciences. We don't pretend to be such a generalizer, but we hope to find or inspire one.

There is nothing difficult in understanding the fundamentals of colloid chemistry unless one wishes to apply the mathematical theories and formulas that have been developed to make it a practicable science. These can very well be left to specialists and researchers, but ordinary people interested or engaged in production and use of cement and aggregates may without too much effort grasp an understanding of the possibilities in application of colloid chemistry.

The impact of this will become more apparent to aggregate producers when the proposed new specifications for concrete aggregates of the American Society for Testing Materials, now in the making, are formally presented to the industry. For the first time in a specification for general use there will be limitations on "potential alkali reactivity" of aggregates.

Water, the Villain

While there are various theories to account for what takes place in concrete when it expands and disintegrates from the demonstrable reaction between the alkalies of cement and certain forms of silica in the aggregates, it is proved that the reaction does not take place in concrete which is continuously dry. Hence, specifications restricting the use of aggregates because of possible reaction with the alkalies of cement, may be adopted and applied by engineers and architects to structures where there will be no possibility of such reaction. That is why we contend that it is neither the cement nor the aggregates, *per se*, which causes the reaction, but water retained in or infiltrating into the concrete. Since deterioration does not always happen, obviously there is involved some fundamental physical or chemical truth or natural law which we are trying to meet by empirical rules instead of by accurate scientific knowledge.

"Surface Chemistry"

The first thing necessary to understanding colloid chemistry is that it is "surface chemistry," as distinguished from molecular chemistry. Colloids are merely very small particles of matter, which ordinarily retain all the properties of larger particles of the same material, but have additional special properties because of their very small size.

Most inorganic or mineral colloids appear to have electrostatic (ionic) or some surface force which either attracts or repels other particles, of the same material, or some other material, such as water, for example. In the case of colloids these forces of attraction and repulsion are easily shown because colloids have large surface area in proportion to volume.

But surface chemistry can also apply to the surface of any sized particle A good illustration of this is the "stripping" of siliceous aggregates when used in some types of asphalt pavement. The surface of the aggregates is of such character, or it carries some physical or chemical charge, that it absorbs or adsorbs water [hydroxyl (OH)] ions in preference to asphalt. Ions are small particles which may or may not be atoms.

Silica particles (SiO_2), since they have twice as many atoms of oxygen $O^{=}$, which have negative charges, as they have of silicon Si^{++} which have positive charges, in general are negatively charged on their exposed surfaces. This makes them repel other negatively charged particles, such apparently as particles of asphalt, but attract positively charged particles such as those of lime or calcium. The negative charge on silica particles can be neutralized and possibly reversed by coating and impregnating them with lime or some other positively charged material in a finely enough divided state to contact both the outside surface and the surface on interior pores or capillaries. This can be done by first drying the ever-present moisture out of the silica, which possibly enlarges the pores and capillaries, and soaking in lime water, that according to chemists contains both chemically dissolved lime [CaO or $Ca(OH)_2$] and Ca $(OH)_2$, in colloidal form.

More Surface Chemistry

That example of surface or colloid chemistry is familiar to many readers. Practical solutions to the problem of successfully using siliceous aggregates in asphaltic-type pavements are therefore available, whether or not commercially feasible at this time.

There is reason to believe that aggregate embedded in portland cement mortar also undergoes surface reactions depending both on the materials liberated in the hydration of the cement and the nature of the aggregate. Reaction between certain siliceous aggregates and the alkalies in hydrated cement is not necessarily harmful; if there is enough of it, as when a pozzolan is one of the aggregates, it is evidently advantageous.

Thus far agricultural chemists have made most use of mineral colloid chemistry and have solved many hitherto baffling problems by a study of the structure of clay soils. In many respects hardened concrete resembles a dried-out clay. Not to the same degree of course, but concrete absorbs moisture and expands, and drys out and contracts. It corresponds to what is termed in soil chemistry a dispersed clay, in which the thin platelets of clay mineral are arranged in orderly fashion like brick in a wall. Every particle is surrounded snugly by other particles and the intercommunicating channels (capillaries) are very narrow. Water and air permeate such a soil very slowly, but water when it does fill the channels causes swelling by separating the courses of platelets. A flocculated clay, which is desired for agriculture, has its platelet arrangement broken up into unsymmetrical crumbs or bunches, providing a more open network of larger channels, in which water and air can circulate. Is it possible that one advantage of air-entrained concrete is

(Continued on page 126)

What's behind the Euclid name?

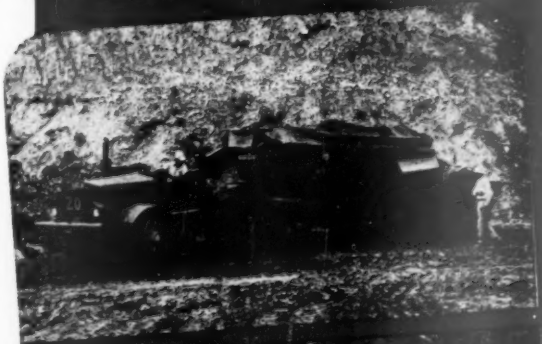
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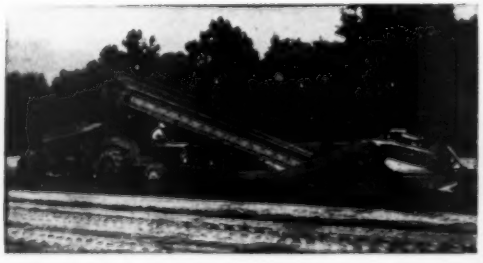
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LABOR RELATIONS TRENDS

Holes in Wage and Price Stabilization Plan

By NATHAN C. ROCKWOOD

EMPLOYERS ARE PROBABLY well aware by this time that the federal government's so-called wage stabilization program is anything but that. New regulations changing previous ones or raising previous ceilings, more or less surreptitiously, issue so fast it is difficult from one who does not make a business of it, to keep up. A fair-minded person probably finds it difficult to condemn union labor bosses alone for making the most of their opportunity, and employers struggling for labor in defense industries in a short market cannot any more be condemned for being willing at the moment to meet labor's every demand. It is merely another sad demonstration of the supremacy of individual human thoughtlessness and selfishness; how a majority in all walks of life apparently put their own wants and desires ahead of all else, including the economic health of the nation.

The National Wage Stabilization Board consists of 18 members, six each from the public, labor and industry. The labor representatives appear to act from but one motive, which is to keep on hiking wage rates. The public interest members are usually picked because they are professional sociologists, whose interests they themselves regard as governed primarily by humanitarian considerations; and industrial corporations or employers generally seldom excite humanitarian considerations. The result usually is that labor proposes and presses, public agrees and industry protests but is outvoted. Meanwhile, the price stabilizer tries to keep ceiling *prices*, while all logic would place the emphasis on keeping ceiling *costs*. If that were done prices would take care of themselves.

The lack of logic in application of price ceilings could be illustrated by thousands of instances, but a single one in our own industries is typical. The Office of Price Stabilization (OPS) has authorized the ready-mixed concrete industry to increase prices enough to cover the increased cost of portland cement when it is necessary to procure it from out-of-area sources; in other words, when the ready-mixed concrete producer has to pay the cost of the additional freight rate from greater distances than he has been accustomed to go for his cement.

But, in the meantime freight rates on cement from his normal sources of supply have been increased. These increases, the OPS has decided, can not be added to the price of ready-mixed concrete. The *logical* result of such a ruling would be for all ready-mixed concrete producers to buy all their cement from distant sources, which certainly would not be a desirable, although the legitimate, method of raising the ceiling prices of their products. To do otherwise is to penalize them for producing their product for the lowest *cost*.

While the OPS appears to be making every effort, logical or otherwise, to keep ceilings on many products, these ceilings nevertheless are being punctured every day in special cases. The best proof of this is the federal government's own Bureau of Labor Statistics' cost-of-living index, which increased 1.1 points for the quarter period; 0.6 percent increase was for the month from August 15 to September 15 alone. According to Secretary of Labor Tobin, this index has increased 10.1 percent since January, 1950. Yet during the most recent month's statistics there were widely advertised department store, cut-price sales of clothing and home furnishings, to unload excessive inventories. The price index was therefore largely influenced by goods manufactured before the recent general 10-percent increase in wage rates. New goods can hardly fail to be higher priced, and the cost-of-living index is due for a still greater rise. In fact on November 9, Price Stabilizer DiSalle announced relaxing of price curbs on the products of over 100,000 manufacturers.

Escalator Wage Rises

These increases in the BLS index are particularly significant for they insure punctures in the current wage ceilings. Because a few strong unions, prior to the establishment of a wage stabilization program, had contracts which tied their wages to the cost-of-living index, and every rise in the index assured them an automatic rise in hourly wages, there was little the Wage Stabilization Board could do but to recognize these contracts, in spite of their obvious inflationary effect. Then, naturally, it was decided that other labor which did not have the foresight to get such contracts, or who had employers who resisted the inflationary urge, should not be penalized for their misfortune, and the escalator wage privilege was extended to practically all employes who had union contracts.

Of course, there is no more certain way of raising the cost-of-living index than to raise wages to keep up with it. A price ceiling cannot hold under such conditions, for producers cannot be expected to, and under present laws, thank heaven, cannot be compelled to, produce goods at a loss. A good recent example is that of certain kinds of meat which practically disappeared from the markets until the ceiling prices were raised.

The annual convention of the CIO in New York City in November passed resolutions calling for a $1.25 minimum hourly wage, as well as a guaranteed annual wage. The attitude of the federal government toward these demands was expressed in an address to the convention by Secretary of Labor Tobin who said that bringing "a far larger number of Americans" into the unions would contribute to the "nation's economic health." He bemoaned the fact that there were probably about 20,000,000 workers who had not yet received "cost-of-living" increases because of the BLS index rise. "Bringing the wages of these workers up to match the rise in the cost of living will not destroy the stabilization program," he said. Continuing he concluded, "failing to do it may break the spirit and morale of a great many workers." What is an honest economist going to do with that kind of reasoning? Isn't the morale and spirit of a great many workers going to break when they wake up to the fact that their pension and insurance money will have to be paid in 25c or 10c dollars, instead of even the 50c dollars of today?

Can't Meet Every Situation

If one will merely thumb through the file of Wage Stabilization Board regulations and interpretation bulletins, he cannot escape the conclusion that the board has an impossible task. Immediately special cases arise. Some industries that are more or less seasonal, like construction, complain that the base period for starting wage increases is not fair, so exceptions are ultimately made which greatly raise the anticipated increase in construction labor costs. Since most present construction is directly or indirectly for the benefit of the defense program, the taxpayers foot these increased costs of construction just as directly as they do in paying 10c a pound more for beef steak.

The question soon arises as to the place of fringe payments to workers, such as longer vacations, more insurance benefits, etc., etc. The first reaction was to recognize them for what they actually are, an increase in wages, since they add just as much to the increased labor costs of the product as if they were paid in wages. Seeing the possibility that there might *sometime* be a freeze on wages, union negotiators have made the most of extending and increasing these fringe benefits, where the deciding factor in the Wage Stabilization Board is the public with its six votes for humanitarian impulses.

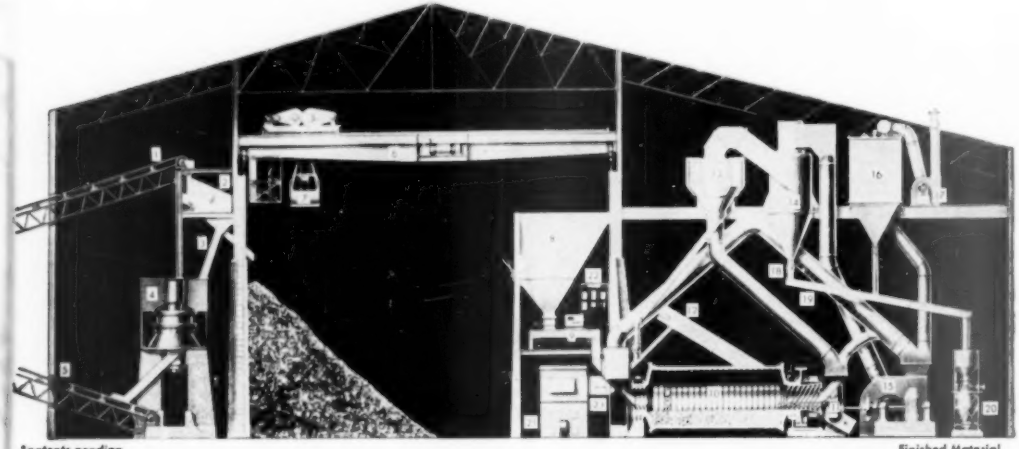
Other issues that have arisen are travel expenses, reduction in contributions by employes to pension plans, increase in food allowances, increases to meet requirements of the Davis-Bacon Act (public works contracts), increases necessary to pre-

(Continued on page 128)

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for raw stone, ore and clinker grinding lowers grinding costs...reduces power consumption...cuts maintenance costs



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7 Clamshell bucket
8 Mill feed hopper
9 Weighing feeder
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the *Personal Side* of the news

Sales Representatives

DENNIS J. O'CONNOR, formerly sales representative in the Fresno and Bakersfield area for Kaiser Gypsum, a division of Kaiser Industries, Inc., Oakland, Calif., has been transferred to Long Beach, where he replaces James Walsh, who has been assigned as representative specializing in plaster sales. Joseph M. Angelo has been named to succeed Mr. O'Connor as sales representative in Fresno and Bakersfield. He was associated with the Penn Mutual Life Insurance Co. prior to joining Kaiser Gypsum.

Research Board Director

FRED BURGGRAF, formerly associate director, has been named director of the Highway Research Board, Washington, D. C., succeeding the late Roy W. Crum. Mr. Burggraf, who has been acting director since last spring, has been associated with the board for 15 years. He formerly served with the Structural Materials Division of the National Bureau of Standards and then became research engineer for the Illinois Division of Highways. He joined the Highway Research Board in 1928 as research engineer, returning to the Bureau of Standards as a research fellow for the Calcium Chloride Association, later becoming research engineer for the association. He returned to the Highway Research Board in 1940 as assistant director. In 1945 he was named associate director. Mr. Burggraf is a member of the American Concrete Institute, American Society for Testing Materials and the American Society of Civil Engineers.

Sales Manager

WILLIAM C. BROPHY has been appointed sales manager, and Charles E. Gibson, assistant sales manager for the California district of Southwestern Portland Cement Co., Los Angeles, Calif.

General Manager

JULIEN O. HEPPES, director of sales for the Tile-Tex division of Flintkote Co., has been appointed general manager of the Azrock products division, with headquarters in San Antonio, Texas.

Association Secretary

JOHN HARRIS, Florida district sales manager for Universal Concrete Pipe Co., Columbus, Ohio, has been elected secretary and a director of the Southeastern Concrete Pipe Association.

Production Engineer

WILLIAM J. SPRAU, plant engineer at the Kalamazoo, Mich., plant of the National Gypsum Co., Buffalo, N. Y., has been appointed production engineer for the company's four paper plants. Before joining National Gypsum in 1947, Mr. Sprau served as assistant chief engineer for the Detroit Sulphite Pulp and Paper Co.

Assists Managing Director

THOMAS K. BREITFUSS has been appointed assistant to Howard F. Peckworth, managing director of the American Concrete Pipe Association,



Thomas K. Breitfuss

Chicago, Ill. He was formerly with the Ragnar Benson Construction Co. and the sewage engineering department of the Chicago Pump Co. Mr. Breitfuss received his B.S. in civil engineering at Northwestern University Technological Institute in 1949. He attended the University of California at Los Angeles, the New Mexico College of Agriculture and Mechanical Arts, and the Biarritz American University in France during 16 of his 39 months in the U. S. Army. He spent 18 months overseas and fought in Europe with the armored artillery of the 12th Armored Division.

Sales Manager Retires

C. R. SMITH has retired as Chicago district sales manager of Alpha Portland Cement Co., Easton, Penn., after 30 years of sales activities with the company. C. K. MacTaggart, who has been assistant to Mr. Smith, has been named to succeed him as Chicago district sales manager. Mr. MacTaggart has been associated with Alpha since 1924.

Association President

E. R. STEVENS, vice-president and a director of Baldwin-Hill Co., Trenton, N. J., has been elected president of the National Mineral Wool Association, New York, N. Y. Mr. Stevens has been a member of the firm since 1937. Prior to that he was associated with Johns-Manville Corp. and The Eagle-Picher Co.

Chief Chemist

S. L. MEYERS, formerly chief chemist of the El Paso, Texas, plant of the Southwestern Portland Cement Co., Los Angeles, Calif., is now chief chemist of the Port Huron, Mich., plant of Peerless Cement Corp., Detroit, Mich.

Cement Official Retires

STANLEY E. DANNER has retired as a director of the Allentown Portland Cement Co., Catasauqua, Penn. He has also retired as treasurer of the Fuller Co., secretary and treasurer of the Willow Rock Co., and secretary and assistant treasurer of the Separation Process Co.

Named Directors

JOSEPH PATTERSON BINNS, executive vice-president and general manager of the Waldorf-Astoria, New York, N. Y., and Frank Nugent, vice-president of Freeman Coal Mining Corp., Chicago, have been elected directors of Material Service Corp., Chicago, of which Col. Henry Crown is chairman of the board.

Re-elected Vice-President

GEORGE W. HANDY of the National Gypsum Co., Buffalo, N. Y., has been re-elected vice-president of the Acoustical Materials Association, New York, N. Y. Charles J. Nocar of E. F. Hauserman Co., Cleveland, Ohio, was re-elected president of the association.

Sales Representative

ANTHONY C. CONSTANTINE has been appointed sales representative for the eastern Pennsylvania territory of Keystone Portland Cement Co., Philadelphia, Penn. He will cover the highway and heavy construction field. Mr. Constantine is the son of William Constantine, who is sales manager for Keystone and well known throughout the construction industry.

Named Superintendent

TED T. BIDDLE has been appointed mill superintendent of the American Fluorspar Co., Salida, Colo. He was formerly superintendent of the Emperius mill in Del Norte, Colo., and will be succeeded in this position by Warren Caton.



William Wallace Mein (left), founder of Calaveras Cement Co. and chairman of the board, congratulates H. C. Maginn on his 25th anniversary with the firm. Mr. Maginn is now executive vice-president and chairman of the management committee

Completes 25 Years of Service with Calaveras

H. C. MAGINN, executive vice-president and chairman of the management committee of Calaveras Cement Co., San Francisco, Calif., was honored at a luncheon of company executives recently upon his completion of 25 years in the service of the firm. William Wallace Mein, founder of the company and chairman of the board, presented Mr. Maginn with a traveling bag in commemoration of the anniversary. Mr. Maginn joined Calaveras in 1926 in the Sacramento Valley territory. He soon became sales manager, and in 1941 was elected a vice-president. Last April he was appointed executive vice-president, retaining his management committtee post. During his 25 years with Calaveras, the company has risen steadily in importance among Western manufacturers. Well known in the Western construction field, Mr. Maginn served as a member of the Civilian Production Administration Board during World War II and postwar years. He has been a director of the Northern California Chapter of the Associated General Contractors for more than 10 years, and serves also as chairman of the association's military affiliation committee.

Assistant Secretary

DELMAR P. MCARTOR has been appointed assistant secretary of Universal Concrete Pipe Co., Columbus, Ohio, in addition to his duties as credit manager. Billy T. Sumner has been named engineering representative in areas covered by the Nashville, Tenn., plant and the Dixie Concrete Pipe Co., Louisville, Ky., and Leroy Smith has been appointed sales representative at the Norristown, Penn., plant.

General Chemist

JOHN L. GILLILAND, JR., formerly head of the chemical and cement laboratory of the Bureau of Reclamation, has been appointed general chemist for Ideal Cement Co., Denver, Colo. Mr. Gilliland has had considerable experience in all phases of analysis and testing of portland cement and concrete, and will make his headquarters at Ideal's research laboratory in Fort Collins, Colo.

Transferred

W. C. FURLONG, service engineer for the Hawkeye-Marquette Portland Cement Co., Des Moines, Iowa, has been transferred to the St. Louis sales office of the parent company, Marquette Cement Manufacturing Co. as service engineer in the Missouri and southern Illinois area.

Board Chairman

J. S. COXEY, JR., president of Industrial Silica Corp., Youngstown, Ohio, has been named chairman of the board.

Joins Sales Consultants

ROBERT W. TEICHMANN, formerly with the Gypsum Association, Chicago, Ill., has become affiliated with Phillips Associates, sales consultants of Chicago.

General Sales Manager

HAROLD R. DANNHAUSEN, formerly sales manager of retail yards for the Consumers Co., Chicago, Ill., has been appointed general sales manager. Robert J. Hummel, vice-president, has been placed in charge of all aggregates operations of retail yards in Chicago.

Transferred to Canada

FRANK C. APPLEYARD, production engineer, U. S. Gypsum Co., Chicago, Ill., has been transferred to the company's plant at Hillsborough, New Brunswick, Canada.

Chief Chemist

JOHN H. REICHENBACH has been appointed chief chemist of the Coplay Cement Manufacturing Co., Coplay, Penn.

Directors Re-elected

HORACE C. KRAUSE, president; C. H. Krause and W. E. Schmidt, vice-presidents of Columbia Quarry Co., St. Louis, Mo., have been re-elected directors of the company for one-year terms.

Host to Foreign Students

ROBERT S. MCCLELLEN, vice-president and general plant manager of the Gouverneur Talc Co., Inc., New York, N. Y., recently played host to a group of foreign student delegates to the World Youth Assembly at Ithaca, N. Y., by taking them on a tour of the mining area near Gouverneur and to the Balmat, N. Y., operations of the company.

Crowned Radio Queen

MARJORIE MOYLE, daughter of William Moyle, superintendent of the Brandon, Miss., plant of Marquette Cement Manufacturing Co., Chicago, Ill., won the title of Miss Southern Radio Queen in a recent talent contest in Jackson, Miss. Along with winners from other sections of the country, Miss Moyle enjoyed an all-expense-paid trip to Florida and Cuba.

Correction

ARNOLD J. JOHNSON has been promoted to assistant operating manager of Lehigh Portland Cement Co., Allentown, Penn., and not operating manager as reported on page 81 of the October issue of ROCK PRODUCTS. Mr. Johnson was formerly manager of the Mason City, Iowa, plant.

OBITUARIES

THOMAS J. COE, who opened the first stone quarry in Scioto county at McDermott, Ohio, died October 19. He was 85 years of age.

LOUIS N. BANGERT, president of the St. Charles Quarry Co., St. Charles, Mo., died October 19 at the age of 61.

JOSEPH T. JOHN, SR., superintendent of the Medusa products division, York, Penn., of the Medusa Portland Cement Co., Cleveland, Ohio, died August 30. He was 50 years of age.

EDMOND U. RAGLAND, secretary-treasurer of the Superior Stone Co., Raleigh, N. C., which he organized in 1926, died unexpectedly on October 7. He was 60 years of age.

ALONZO F. WALTER, former secretary-treasurer and director of the Lehigh Portland Cement Co., Allentown, Penn., died September 5 at his Eustis, Fla., home. He was 84 years old and had retired in 1931 because of ill health. He became associated with the company in 1906 as credit manager, later becoming secretary-treasurer and a director.

FRANK T. SHEETS, president of the Portland Cement Association, Chicago, Ill., died November 3. He was 61 years of age. Mr. Sheets joined the association in 1933 as consulting engineer with a background of 12 years as chief highway engineer and superintendent of highways for the State of Illinois. Prior to his election in 1937 as president of the P.C.A., he served as consulting engineer and director of development, and it was during this time that a number of important technological advancements were made in the fields of portland cement and concrete. Outstanding among these were the development of soil-cement for paving light traffic roads and streets, and the tilt-up method of construction.

Mr. Sheets was instrumental in bringing about the long-time study of cement performance in concrete to observe the behavior of portland cement in concrete under many varying conditions of climate, soil and water. Under Mr. Sheets, the Portland Cement Association built the $3,000,000 laboratory in Skokie, Ill., which is considered the largest and the most completely equipped in the world devoted exclusively to research in cement and concrete. He also organized a program of national advertising and public relations.

Born in Lafayette, Ohio, in 1890, Mr. Sheets moved with his family to Springfield, Ill., when he was 15 years old. After graduating from high school, Mr. Sheets started to work in the Illinois Department of Highways as blueprint boy and file clerk. He attended college and upon completion



Frank T. Sheets

of his course he entered the highway department and successively became assistant engineer, assistant bridge engineer, assistant maintenance engineer, bridge engineer, engineer of design, and finally superintendent of highways and chief engineer.

Mr. Sheets has served as president of the American Association of State Highway Officials, the Mississippi Valley Highway Conference, and the Central Illinois section of the American Society of Civil Engineers.

V. O. JOHNSTON, chairman of the board of The Lincoln Sand and Gravel Co., Lincoln, Ill., passed away at Summit, N. J., on October 6. He was 78 years old and had been seriously ill for two months. Mr. Johnston was a graduate of Oberlin College, Oberlin, Ohio, and later received a law degree from Western Reserve University at Cleveland. He was a practicing attorney in Cleveland prior to starting his career in the sand and gravel business in 1907. He was president of the Lincoln Sand and Gravel Co., until March, 1951, when he was elected chairman of the board. Mr. Johnston served as president of the National Sand and Gravel Association in 1920 and 1921, and was always actively interested in association affairs.

HAMILTON P. CALDWELL, chairman of the board of directors of the Ohio River Sand Co., Louisville, Ky., died suddenly of a heart attack on September 30 in White Sulphur Springs, W. Va., while attending the semi-annual meeting of the board of directors of the National Sand and Gravel Association. For many years Mr. Caldwell took an active, personal interest in the affairs of the association and served on the board of directors and on the executive committee.

J. CLIFFORD EVANS, former chief chemist for the Nazareth Cement Co., Nazareth, Penn., died September 23 in Allentown after a long illness. He was 65 years old. A well-known figure in the cement industry, Mr. Evans had retired in 1949, after he served for about 10 years as an assistant chemist at Martin's Creek, Penn., plant of Alpha Portland Cement Co. He received the doctorate in chemical engineering from the University of Pennsylvania in 1942. Before joining the Nazareth Cement Co., Mr. Evans did technical work for the U. S. Bureau of Standards in Washington. He also worked as a chemist for Hercules Powder Co. and Hugh L. Cooper & Co. in the construction of Wilson Dam, Florence, Ala. During World War I, Mr. Evans served as a chemist on purification of TNT and on the manufacture of smokeless powder from wood. He served for many years as a member of the technical problems committee of the Portland Cement Association. He was active in the American Society for Testing Materials, American Concrete Institute, and American Chemical Society.

ERIC WILLIAM RYBERG, who retired in 1947 as president of the Utah Sand and Gravel Products Corp., Salt Lake City, Utah, but remained as vice-president and a member of the board of



Eric William Ryberg

directors, died September 30. He was 67 years of age. Mr. Ryberg, who was also a director of the Utah Lime and Stone Co., was recently named an honorary member of the board of directors of the National Sand and Gravel Association, Washington, D. C. He was a past president of the Intermountain Branch of the Associated General Contractors of America; a director of the Gunnison Sugar Co. and the Home Fire Insurance Co.; and chairman of the executive board of the Utah-Idaho Sugar Co.

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EFFICIENT, economical air compressor operating requires an oil that is *exactly right* for your particular operating conditions. To meet this requirement you have only to use the recommended Texaco air compressor oil. A Texaco Lubrication Engineer will gladly help you.

—Under normal conditions, a Texaco *straight mineral* air compressor oil will assure clean operation, minimum wear, lower maintenance costs.

—Under conditions causing rust in cylinders, coolers, lines and receivers, a Texaco *rust-inhibited* air compressor oil will keep compressors and systems rust-free whether running or not.

—Where service conditions are extremely severe, a Texaco *heavy-duty* air compressor oil will prevent harmful formations of carbon and sludge.

—To combat excessive wear under "wet cylinder" conditions, a Texaco *compounded* air compressor oil will keep wear at a minimum.

Call in a Texaco Lubrication Engineer. Let him tell you about the Texaco Simplified Lubrication Plan that will let you handle *all* your major lubrication with *only six* Texaco Lubricants. A time-saving, cost-saving set-up. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LONGER DRILL LIFE, more footage drilled, lower costs — count on these benefits when you use *Texaco Rock Drill Lubricant EP.* This series of "extreme pressure" lubricants give full protection against wear, guard against rust whether drills are running or idle.

TEXACO

TEXACO Lubricants and Fuels

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. METROPOLITAN OPERA broadcasts every Saturday afternoon.



INDUSTRY News

Cement Off Critical List

THE NATIONAL PRODUCTION AUTHORITY recently removed nine building materials and chemicals from List A of Notice 1 which restricts the manufacturer's inventories of scarce materials. These items were removed from control because they are now in more plentiful supply. They include portland cement, gypsum, sheathing and lath, cast iron soil pipe and fittings. At the same time, 96 more scarce items, mostly chemicals and metals, were added to the critical list.

Dolomite and Magnesite

BASIC REFRACTORIES, INC., Cleveland, Ohio, expects its sales volume to reach $13,000,000 this year, compared with $10,000,000 in 1950.

Earnings for the third quarter of 1951 were about the same as for the second quarter when net equalled $0.40 per common share. Earnings for the first quarter amounted to $0.34 per share. This year's earnings have been affected by additional expense for expansion at the company's Gabbs, Nev., magnesite development.

Basic Refractories is a producer of granular dolomite and magnesite refractories used in lining open-hearth furnaces in steel production, also commercial stone products. Because of the increase in steel-making capacity, the company has embarked on an expansion program. It has spent $2,500,000 at the Nevada property and plans to spend about $3,500,000 at its Ohio plants. At present, the company is negotiating with the Reconstruction Finance Corp. on certain provisions of a $4,000,000 loan for the Ohio expansion.

Wage and Salary Regulations

A PUBLICATION entitled "How to Operate Under the Wage and Salary Stabilization Rules Governing Adjustments in the Rates of Pay of Individual Employes," has been prepared for the National Sand and Gravel Association, the National Ready Mixed Concrete Association and the National Industrial Sand Association, by Herbert Unterberger, a consulting economist specializing in labor-management relations and an expert in the field of wage and salary stabilization. The publication deals with both the revised General Wage Regulation 5 and the General Salary Stabilization Regulation 3.

Vincent P. Ahearn, executive secretary for the associations, stressed the importance of the question of permissible adjustments in the rates of pay of individual employes, and urged all members to familiarize themselves with the regulations, however complicated and confused they may seem. He pointed out that most members would be mainly concerned with the personal or random rate methods of payment or, in the case of members with union agreements, the single rate method of payment would be of importance.

Applications which should be filed under the various regulations with the Wage Stabilization Board should be presented to the nearest office of the Wage and Hour Division, which in turn will refer them to the appropriate Regional Wage Stabilization Board for final action in most cases, subject of course to the right of appeal against an unfavorable decision. In the case of the Salary Stabilization Board, applications should be filed with S.S.B. headquarters in Washington. The S.S.B. has no regional offices and the local offices of the Wage and Hour Division do not have authority to receive S.S.B. applications.

Lightweight Aggregates

THE DEPARTMENT OF GEOLOGY and Minerals Industries of the State of Oregon recently announced the publication of a booklet on "Lightweight Aggregates Industry in Oregon," by Ralph S. Mason. The department's work has been along both geological and engineering lines in encouraging the industry's growth.

The lightweight aggregates discussed in the booklet include pumice, volcanic cinders, diatomite, expanded shale, perlite and volcanic tuff. The location and extent of the deposits, their composition and uses are discussed. Copies of the booklet may be obtained from State Department of Geology and Mineral Industries, 702 Woodlark Building, Portland 5, Ore., for $.25 per copy.

Liming Materials

THE TOTAL CONSUMPTION of liming materials on U. S. farms in 1950 amounted to 26,535,800 tons, according to the report compiled jointly by the National Lime Association and the Agricultural Limestone Institute. This total included 25,266,600 tons of agricultural limestone; 121,500 tons of burned lime; 213,500 tons of hydrated lime; and 469,600 tons of marl. Consumption of liming materials in 1949 totaled 26,301,349 tons, which included 25,164,036 tons of agricultural limestone; 120,705 tons of burned lime; 198,259 tons of hydrated lime; and 520,363 tons of marl.

Cement Merger?

A TEMPORARY INJUNCTION has been issued to restrain Lawrence Portland Cement Co., New York, N. Y., which has plants in Northampton, Penn., and Thomaston, Maine, from considering a proposed merger with Dragon Cement Co., a subsidiary of Lawrence. The injunction was obtained by three members of the firm's board of directors who were newly elected as directors last March and who term themselves as representatives of minority stockholders.

The suit claims that Dragon Cement Co. is a wholly-owned subsidiary of Lawrence, without assets for such a merger. In connection with the proposal, the suit charges, it is planned to eliminate cumulative voting—which gives representation to minority stockholders—from the bylaws. Such voting is required by Pennsylvania law, but not by Maine. Also included in the suit was reference to a vote scheduled for the special meeting on whether the six majority directors are to be sole directors of the new corporation or whether the present nine directors (including the three plaintiffs) shall remain on the board.

Buys Fluorspar Mine

OZARK-MAHONING CO., Rosiclare, Ill., has purchased fluorspar deposits near Cowdrey, Colo., from Colorado Fluorspar Corp. The fluorspar deposits are said to be high grade and the company expects to ship 250 tons of crude ore daily. A new plant, to be built at a cost of $1,000,000, is expected to be in operation by May 1, 1952.

Cover Picture

THIS OVER-ALL view of the Humphreys Gold Corp.'s Trail Ridge ilmenite operations near Starke, Fla., shows the unique arrangement of the washing and concentrating section on floating barges. Ilmenite sands are delivered from a suction dredge at approximately 1200 t.p.h. After screening, the flow is split evenly to seven 12-ft. Dorr FX classifiers, where the sands are deslimed and dewatered. Recovery of the ilmenite from the classifier rake product is handled by Humphreys spiral concentrators, and two 5-ft. Dorr FH classifiers provide final washing and dewatering of the ilmenite concentrates. Further information on the Trail Ridge operation can be found on page 92 of this issue.

International Minerals' Expansion Program

INTERNATIONAL MINERALS AND CHEMICAL CORP., Chicago, Ill., recently announced that its directors have authorized a plan to acquire all the outstanding stock of Hoover and Mason Phosphate Co. for about 40,000 shares of International's common stock. International will acquire between $750,000 and $800,000 in cash or current assets and about 2500 acres of phosphate mining property in the Rutherford Creek area of Maury County, Tenn.

International also announced it is expanding capacity by extending its mine at Carlsbad, N. M. In the last year the company has spent $5,000,000 for plant expansion and has made commitments for an additional $12,000,000. One new plant, now under construction, will increase output of a phosphate ingredient for animal feed. Other projects include a $2,000,000 potash chemical plant at Carlsbad, a $2,000,000 addition to the Amino Products plant in California and a $1,000,000 laboratory near Chicago.

Regional Safety Meeting

THE EASTERN NEW YORK Mineral Aggregates Safety Council which was organized to promote safety in the industry, held its fourth plant visit recently at the Catskill, N. Y., plant of North American Cement Corp.

After a short preliminary meeting, the delegates visited the ledge, crusher building and observed the conveyor system for the storage silos. At lunch, they were guests of North American Cement Corp. Following the lunch, a short business session was held at which time, John Kawaske, president, briefly reviewed his previous experience in the quarrying business with Alpha Portland Cement Co. He also gave a brief outline on the history of the plant being visited.

The secretary's report brought out the fact that members reporting to the National Crushed Stone Association Safety Competition for the months of May, June and July, reported 26 percent of all injuries as back injuries. It was suggested that the council do what it could to eliminate the causes of these accidents. The question of phony back claims also brought forth considerable discussion.

Another point brought out at the meeting was that this group was indirectly responsible for the formation of a similar safety group in the Adirondack mining industry which was organized under the name of Northern New York Mine Safety Exchange Group.

After the business session, the group returned to visit the plant proper. Of special interest was the new 6,000,000-gal. fuel oil tank and the $2,000,000 kiln, both recently installed. Following the plant visit, a critique was held and the group presented its findings in regard to safety features of the plant. A few minor points as to safety improvements were suggested but, on the whole, the plant was found to be in good condition and the management was complimented on the good housekeeping.

Home Builders' Show

THE EIGHTH ANNUAL convention and exposition of the National Association of Home Builders will be held in Chicago, Ill., January 20-24, 1952, in the Stevens and Congress hotels.

Convention sessions will include comprehensive coverage of all important national issues affecting the building industry as well as a wide range of activities devoted to the technical and business problems of the individual builder. The exposition, expected to be the largest ever held, will include the latest building materials and home equipment.

Portland Cement Production

THE PORTLAND CEMENT INDUSTRY produced 22,269,000 bbl. of finished cement in September, 1951, as reported to the Bureau of Mines. This was an increase of 6 percent compared with the output in September, 1950. Mill shipments totaled 23,256,000 bbl., an increase of 2 percent over the September, 1950, figure, while stocks were 35 percent above the total for the same month in 1950. Clinker production during September, 1951, amounted to 21,650,000 bbl., an increase of 7 percent compared with the corresponding month of the previous year. The output of finished cement during September, 1951, came from 154 plants, located in 36 states and Puerto Rico. During the same month of 1950, 20,945,000 bbl. were produced in 150 plants.

Coming Conventions

January 15-17, 1952—
National Agricultural Limestone Institute, Annual Convention, Hotel Statler, Washington, D. C.

January 16-17, 1952—
Wisconsin Concrete Products Association, 32nd Annual Convention, Plankinton House, Milwaukee, Wis.

January 21-24, 1952—
American Road Builders' Association, 50th Anniversary Meeting, Rice Hotel, Houston, Texas.

February 5-6, 1952—
Missouri Limestone Producers Association, 7th Annual Meeting, Hotel Governor, Jefferson City, Mo.

February 11-15, 1952—
National Sand and Gravel Association, 36th Annual Convention and Exhibit, The Stevens, Chicago, Ill.

National Ready Mixed Concrete Association, 22nd Annual Convention and Exhibit, The Stevens, Chicago, Ill.

February 18-20, 1952—
National Crushed Stone Association, 35th Annual Convention and Exhibit, The Stevens, Chicago, Ill.

February 18-20, 1952—
National Concrete Masonry Association, Annual Convention, New Yorker Hotel, New York, N. Y.

February 18-21, 1952—
American Institute of Mining and Metallurgical Engineers, 79th Annual Meeting, Hotel Statler, New York, N. Y.

February 26-28, 1952—
American Concrete Institute, 48th Annual Convention, Netherland Plaza, Cincinnati, Ohio

February 27-28, 1952—
American Concrete Pressure Pipe Association, 3rd Annual Convention, Drake Hotel, Chicago, Ill.

February 28-March 1, 1952
American Concrete Pipe Association, 44th Annual Convention, Drake Hotel, Chicago, Ill.

March 3-5, 1952—
American Concrete Agricultural Pipe Association, 2nd Annual Convention, Brown Palace Hotel, Denver, Colo.

March 5-6, 1952—
Iowa Agricultural Limestone Association, Inc., 7th Annual Convention, Savery Hotel, Des Moines, Iowa.

June 23-27, 1952—
American Society for Testing Materials, 50th Anniversary Meeting, Hotels Statler and New Yorker, New York, N. Y.

Buys Gravel Plant

PACIFIC COAST AGGREGATES, INC., San Francisco, Calif., recently purchased the property and business of Cache Creek Sand and Gravel Co., Yolo, Calif. The company now owns and operates 11 producing plants in northern California and has 19 distribution plants and warehouses.

Stone Company Sold

SALE OF ASSETS of Canada Crushed Stone, Ltd., Hamilton, Ont., to Canada Crushed and Cut Stone, Ltd., has been completed, according to an announcement by R. G. Harstone, vice-president and managing director. The only asset at the present time is $1,912,000 received from the purchaser, and directors propose to proceed with the distribution of this asset to shareholders on the basis of $30 cash per share held.

Roofing Granules

THE PRODUCTION OF ROOFING GRANULES in 1950, as reported to the Bureau of Mines, amounted to 1,797,729 short tons, valued at $26,852,848, which was an increase of 33 percent in quantity and 34 percent in value, compared with 1949. The total production was the largest on record, and the total average value showed an increase of $.19 per short ton over 1949, also a record value. The production of natural granules increased 39 percent and the artificially colored, 32 percent, while brick granules decreased 42 percent. The average value for natural granules increased $.05 to $8.80; artificially colored, $.35 to $17.21; and brick, $2.19 to $19.31.

Government Potash Leases

SPECIAL RULES governing the leasing and development of potash deposits, oil and gas, on certain lands in Eddy and Lea counties, N. M., were issued recently. The order also revoked the Department of the Interior's order of February 6, 1939, which prohibited oil and gas leasing of 42,685 acres of such lands mainly covered by potash leases in Eddy county.

The special rules apply to federal lands within a designated area, valuable for both potash and oil production, and cover approximately 300,000 acres. The rules were issued for the purpose of encouraging exploratory drilling to discover additional oil reserves and to provide adequate protective measures to prevent damage to important potash reserves. The measures prescribed are general in scope, and detailed requirements will be worked out after consultation with state officials and members of the two industries.

Italian Bentonite

WHITE ITALIAN BENTONITE, a colloidal clay used as an emulsifying, spreading, thickening, plasticizing, absorbing, dehydrating and sizing agent, which for several years has been on the scarce list, is again being imported by Whittaker, Clark & Daniels, Inc., New York, N. Y., exclusive distributor for the product. The company will handle both the high gel and the low gel types. Italian bentonite, because of its whiteness and lack of impurities, is highly desired by many manufacturers.

Whittaker, Clark & Daniels, Inc., will continue to represent American Colloid Co. as its eastern distributor of "Volclay" and "Panther Creek" bentonites. Volclay is a western U. S. bentonite mined in the Black Hills of South Dakota. It is prepared in powdered and granular forms for commercial use. Panther Creek, produced in Mississippi, differs from Volclay in that it is practically non-gel forming and non-suspending in water. Both are gray in color and said to have definite advantages in many applications where color and high purity are not factors.

D.M.A. Withdraws Aid

THE DEFENSE MINERALS ADMINISTRATION is withdrawing government assistance in the production and processing of 11 mineral commodities because the supplies of these materials are now believed to be sufficient to meet all requirements for the next five years, according to a report in *Chemical and Engineering News*. The cutoff means that producers of these materials will no longer be eligible for government loans and rapid tax amortization. The materials affected are limestone, fluxstone, other limestone (used in crushed or broken form as a filler in fertilizer and asphalt), dolomite, caustic lime, hydrated lime, dead burned dolomite, caustic burned dolomite, magnesite, perclase and magnesium oxide.

To Issue Securities

CANADA CEMENT CO., LTD., Montreal, Canada, is undertaking new financing for the $17,000,000 expansion program it currently has underway. It is proposed to authorize a $5,000,000 issue of 10-year serial debentures. Coupon rate is expected to be 4 percent.

Following redemption in 1950 of an issue of serial bonds, capitalization of Canada Cement Co. has consisted entirely of stock, as follows: 1,204,345 authorized, 980,558 outstanding, $20 par $1.30 cumulative redeemable preference shares; and 750,000 authorized, 600,000 outstanding, n.p.v. common shares.

Canada Cement is presently boosting its capacity at Belleville, Ont., and Exshaw, Alta. Its new plant at Havelock, N. B., is nearing completion and is expected to be in production by the end of this year.

Construction Machinery

THE CONSTRUCTION INDUSTRY Manufacturers Association recently announced the publication of the brochure "Construction Machinery is Essential to the Nation's Mobilization for Defense," which was prepared by the C.I.M.A. public relations committee to sell the industry's essentiality to all government officials controlling critical materials. The listings of products used in the brochure are those assigned to the construction machinery division of N.P.A.

This is the first step in a special C.I.M.A. public relations program. Later every firm in the industry will be requested to answer a questionnaire giving more detailed information to develop specific facts and figures.

Sand and Gravel Pricing

THE SAND AND GRAVEL Industry Advisory Committee recently met with officials of the Office of Price Stabilization for the purpose of discussing industry pricing problems. Sand and gravel producers are currently pricing under the General Ceiling Regulation, but plans for the drafting of a "tailored" regulation for the industry are being considered.

The advisory committee asked that O.P.S. make a study of increased inbound transportation costs, increased outbound contract carrier truck rates, and also to consider increased transportation costs where deliveries are made by trucks owned and operated by sand and gravel producers. The committee felt that since inbound and outbound transportation represent a large part of the cost of producing sand and gravel, that these should be permitted to be reflected in ceiling prices when drafting a new regulation. O.P.S. officials assured the committee that consideration was being given to the matter and would be based on rate increases granted to common carriers by order of the Interstate Commerce Commission.

It was also pointed out that producers in many areas are experiencing a decline in market due to the reduction and restriction in construction work. Members indicated there is little, if any, pressure on ceiling prices in the industry at the present and felt there was no need for price control on sand and gravel due to the highly competitive conditions of the industry.

Pavement Yardage

AWARDS OF CONCRETE PAVEMENT for the month of September and for the first nine months of 1951 have been announced by the Portland Cement Association as follows:

	Sq. yd. awarded During September 1951	Sq. yd. awarded During first nine months 1951
Roads	1,681,220	20,107,119
Streets and alleys	2,202,274	19,159,558
Airports	458,159	12,703,568
Totals	4,341,653	51,970,240

HINTS and HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

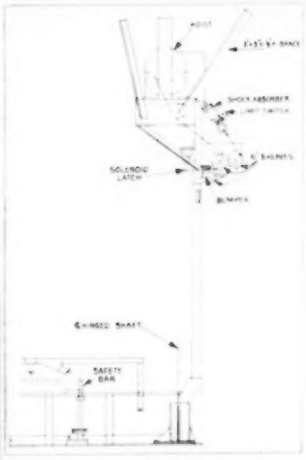


Diagram showing shock absorber on grizzly-cleaning attachment

Cleaning Grizzly

By Paul C. Ziemke

AT AN OPERATION having an isolated heating plant burning mine-run coal, a grizzly was placed over the screw feed hopper to screen out large lumps and to catch tramp iron. Cleaning this grizzly by hand was a time-consuming operation for the fireman.

The diagram indicates how the hoist was hung from the firing-room ceiling to raise the grizzly at the mere touch of a button. An upper limit switch cut off the power if the fireman was too slow to release his finger from the button and a lower limit stopped the downward travel at the proper spot. On several occasions the cable was pulled in two when the grizzly became jammed with ice or debris. To prevent recurrence a shock absorber was installed in the cable's dead end attachment which was spring loaded and designed to expand under the proper tension. As an after thought the electrical men added an outrigger on the plunger eye which actuates a second upper limit switch when the tension on the shock absorber reaches the critical point.

As now installed, any stalling of the hoist movement causes the spring in the absorber to contract and, if the tension is severe, the trigger trips the limit switch and the cable is spared until the cause for stalling is cleared. The second limit switch (in series with the other two) lends the equipment one additional safeguard, in that, if the first limit switch fails to open, the second one on the cable's shock absorber will open as the cable is pulled taut when the grizzly is in the upper limit of its travel.



Unique truck scale installation

Truck Scale Serves Double Purpose

A KENTUCKY CRUSHED STONE OPERATOR solved the problem of constructing a pit for his Winslow truck scales by installing the scales in such a manner that they acted as a bridge over a nearby wet ravine, thereby serving a double purpose. The office and scale house were built alongside. The quarry (limestone) features the use of Euclid trucks loaded by a Lima shovel. Air is from a "365" Gardner-Denver unit.



Segregation is eliminated by use of two conveyor tunnels which almost converge at unloading ends

Tunnels Prevent Segregation

AT BULL SHOALS DAM in north central Arkansas, the Corps of Engineers is nearing completion of its concrete dam. A 7-mile-long belt conveyor is used for hauling aggregate from the quarry to the processing plant near the dam site. Sand is manufactured by use of hammermills as the fine dry grinders. The sand is stockpiled and two conveyor tunnels that almost converge at the unloading ends were installed with the idea of helping to eliminate segregation and it has proved a good investment. One tunnel uses electrical vibrating feeders, and the other, vane feeders; these feed the two reclaiming belts. Sand classification is built around Sturtevant air separators and Roto-clones.

A Freezing Precaution

IN COLD CLIMATES, the problem of keeping water from freezing in supply tanks is a problem to many plant operators. One school of thought on this subject holds that introducing the water into the bottom of the tank and withdrawing it from the bottom only aggravates the problem. It is considered a better plan to introduce the water into the top of the tank (the more turbulence the better) and withdraw it from the bottom.

One operator, who has successfully used the plan, has a 100,000-gal. steel tank in an area where it often gets as cold as 30 deg. below zero. Water is introduced into the top of the tank and withdrawn from the bottom. As an added precaution against freezing, the tank is surrounded with baled hay which is held in place by steel wire.

Discharging Wet Sand

ANYONE WHO HAS EVER tried to handle wet sand (minus ¼ in.) in a bucket elevator knows the difficulty in getting the sand to discharge from the buckets, and it hardly seems worthwhile for a short lift. One operator, in returning oversize sand from a Hum-mer screen to the feed end of a 5- x 12-ft. rod mill, at first used a bucket elevator but soon replaced it with a steeply inclined screw conveyor as illustrated at the right. There was not quite enough fall for the oversize to flow into the bell-type feeder, but the screw installation accomplished the job without difficulty.



Inclined screw conveyor replaces bucket elevator in returning oversize sand to rod mill

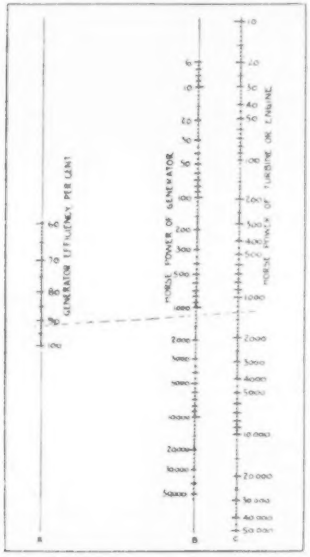


Chart for determining power or efficiency of drive

Power Efficiency Chart

By W. F. Schaphorst

MANY PLANT OPERATORS often want to know the power of an engine, turbine or water wheel, which is used for driving a generator. The whole unit is generally spoken of as "so many horsepower," or "so many kilowatts" which refers to the output of the generator.

The power of the driving unit is determined by dividing the power of the generator by its efficiency and the quotient gives the engine's or turbine's power, as the case may be.

The accompanying chart is intended to assist the reader in performing this division and at the same time to keep the rule always before him.

In using the chart simply lay a straight edge across it, connecting the generator efficiency in column A with the horsepower of the generator, column B, and the intersection of the line through column C gives the answer. Thus for example: What is the power of a steam engine whose generator generates 1200 hp., the efficiency of the generator being 92 percent?

As directed above, connect the 92 in column A with the 1200 in column B as shown by the dotted line drawn across the chart and the intersection of the line with column C shows the answer to be a little more than 1300 hp. In other words, it is a 1300-hp. steam engine.

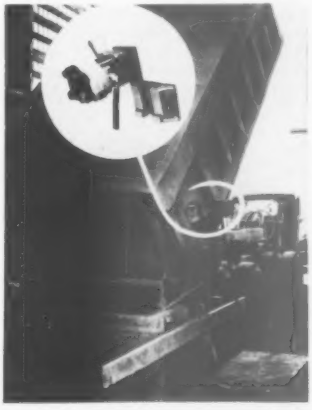
Should the output of the generator be given in kilowatts, as it often is, the chart can be used anyway. The answer in column C will always be given in the same terms as applied to the figure in column B. Thus if it were a 1200-kw. generator in the above problem, the engine could properly be termed a 1300-kw. engine.

In addition, the chart will be found useful for making other determinations involving efficiency. Thus if a given motor is to be installed which must deliver 1200 hp., and if the efficiency of the motor is 92 percent, the same dotted line would show that the wires will have to carry 1300 hp. of current to the motor. If this motor is driven by a single generator and if the generator does not have to supply current to any other wires it will have to be a 1300-hp. generator plus the power consumed in line loss. Where the distance between motor and generator is small this loss is almost nil.

Air Vibrator for Unloading Bulk Cement

AIR VIBRATION EQUIPMENT is finding many new and important uses, one of which is its use in unloading bulk cement. As shown in the illustration, a Cleveland LSRR air vibrator has been mounted in a horizontal position on the side of a 20-ton capacity dump truck. The LSRR is equipped with a cast steel male bracket which fits snugly into the female bracket. It speeds the unloading of all materials that have a tendency to pack down in transit.

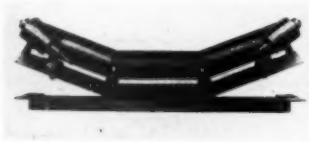
The air vibrator operates only intermittently, just enough to keep the bulk cement moving, yet 40,000 lb. may be unloaded in only 30 min. With continuous operation this time could be reduced. The vibrator has use for many material handling operations and can easily be moved from one installation to another.



Converted truck with air vibrator unloads 40,000 lb. of bulk cement in 30 min.

New Machinery

ROCK PRODUCTS



Belt conveyor carrier

Conveyor Carrier

STEPHENS-ADAMSON MANUFACTURING CO., Aurora, Ill., has announced a belt training carrier which on most applications need only be installed at intervals of 50 to 100 ft. It is reported that the training rollers respond instantaneously to any shift of the belt off dead center and tilt the carrier into an angular position with respect to the direction of belt travel. This returns the belt to center and the carrier resumes its normal position.

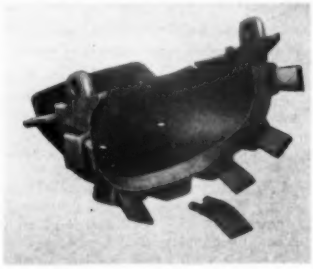
Portable Primary Crushers

SMITH ENGINEERING WORKS, Milwaukee, Wis., has announced a new line of Telsmith portable primary crushers, offered in three sizes. The 25- x 36-ft. size is illustrated.

The crushers consist of a heavy steel receiving hopper with special duty apron-type feeder, heavy-duty roller bearing all-steel jaw crusher with cast steel frame and swinging jaw, steel operators platform with controls, delivery conveyor and power unit with V-belt drive, all mounted on a steel chassis. Front axle with towing pole or king pin for tractor truck hauling can be furnished, and the plant is available with or without grizzly between feeder and crusher. It is said to be suitable for operation in either quarries or gravel pits.

Motor Blowers

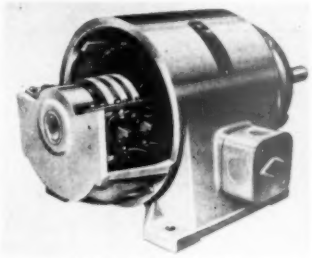
WESTINGHOUSE ELECTRIC CORP., 306 Fourth Ave., Pittsburgh 30, Penn., has announced that plastic is being used to replace critical aluminum and bronze for blowers in its small, totally-enclosed, fan-cooled a-c motors. The plastic blowers consist of a polyester resin reinforced with glass fibers, which are said to have increased resistance to chemical attack, and increased strength per lb. Westinghouse is applying these blowers to Life-Line motors in NEMA frames 254 and 284, 5 and 7½ hp., 1750 r.p.m. They will be applied to other motors later.



Redesigned, self-locking bucket teeth

Bucket Teeth

PARSONS CO., Newton, Iowa, subsidiary of Koehring Co., has announced the development of Tap-In bucket teeth as standard equipment on all Trenchliners, which are manufactured in four sizes to provide a wide digging range: 5 to 72 in. in width, up to 72 ft. in depth. Made of high grade alloy steel and heat treated, the company reports that the teeth are designed with added clearance for maximum wear before replacement becomes necessary. In addition, it is said that the teeth do not need to be reversed, for they are designed to retain a sharp point by constant use until worn down to clearance.



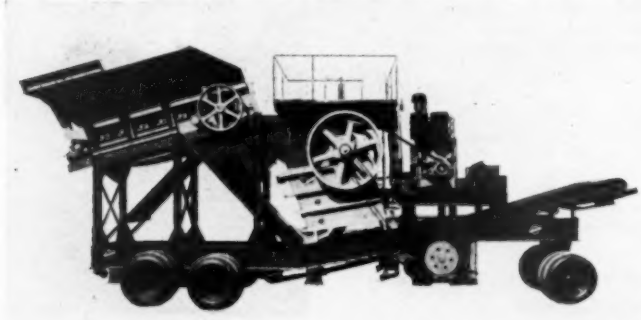
Details of slip ring motor

Slip Ring Motor

REULAND ELECTRIC CO., Alhambra, Calif., has announced its slip ring motor which is said to have wide usage on cranes, fans, crushers and other applications where either variable speed or high starting torque on low starting current is required. The Reuland unit features an arrangement of collector rings and brush assembly which permits their complete housing in the motor's regular end bell. The company states that this cuts off up to 6 in. from conventional lengths. In addition, flat end bells are used to provide added versatility in mounting. These motors are available separately in ratings from ¾-15 hp., or in conjunction with gear reducers, in ratings from ¾-5 hp.; either drip-proof or totally-enclosed.

Self-Lubricating Hard Wood

LIGNUM-VITAE PRODUCTS CORP., 10 Boyd Ave., Jersey City, N. J., has announced the use of lignum-vitae for bearings, bushings, guides, rollers, etc. Lignum-vitae is the hardest and heaviest wood there is, and one-third of its volume is made up of a natural resin which gives it a self-lubricating quality. The company reports that the wood is able to resist many mild acids and chemicals; is preserved and additionally lubricated by water; and because it is nonferrous is rustless and protected against contact with corroded surfaces. Lignum-vitae may be supplied in the form of logs, boards, squares, rods, cylinders, blocks, etc., to specifications.



Portable primary crusher on steel chassis

Drilling Jumbos

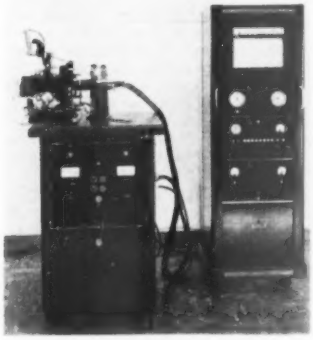
ROGERS IRON WORKS CO., Joplin, Mo., has put into operation two jumbos, each with two hydraulic jib arms with self-leveling operators' platforms, independently driven tracks, mast platform adjustable at any height and electric motor drive. Other jumbos are available with stationary masts, pivoted booms, jib arms mounted directly on the crawler chassis and with air or diesel engine drive.



Jumbo with electric motor drive

Redesigned Engines

GENERAL MOTORS CORP., Detroit Diesel Engine Division, Detroit, Mich., has announced several improvements on the Series 71 diesel engine line, said to prolong engine life and reduce maintenance. Chief among the features is a method of oil, water and compression sealing between the engine block and head which does away with the laminated gasket commonly used in internal combustion engines. A second feature is a chilled-and-tempered cast-iron ring which forms a replaceable seat for the cylinder liner upper flange. In addition the angle of the exhaust valve face and the valve seat inserts has been changed from 45 deg. to 30 deg., which is said to reduce the turbulence of escaping exhaust gases and scavenging air. The improvements are incorporated in current production models of 3-, 4- and 6-cylinder single Series 71 diesels and multiple-engine units ranging from 51 to 800 b. hp.



Fluorescence analysis unit

Minerals Analyzer

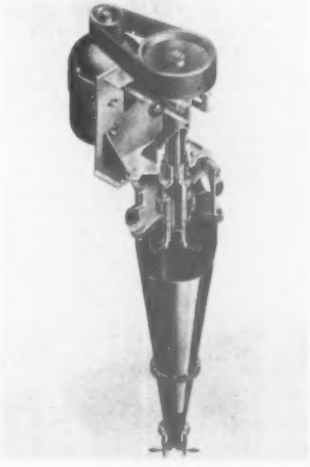
NORTH AMERICAN PHILIPS CO., Research & Control Instruments Div., 750 S. Fulton Ave., Mount Vernon, N. Y., is producing a new Norelco fluorescence analysis unit which is said to incorporate many design improvements to facilitate rapid qualitative and quantitative analysis of constituents in metals, alloys, minerals, ores, etc. The unit employs a wide range vertical goniometer with a sweep radius of 170 mm. instead of the horizontal assembly used on the original model, and also utilizes a horizontal, water-cooled, oil-insulated X-ray tube operated from a standard water-cooled diffraction unit. The unit operates at potentials up to 50 kv. peak and at current values up to 50 ma.

Disposable Rock Bits

MACKINTOSH-HEMPHILL CO., Drill Bit and Tool Division, 901 Bingham St., Pittsburgh 3, Penn., has entered a new field of manufacture, the production of a line of forged steel disposable rock bits. The "DBT Throwaway" bits are being distributed by a newly organized subsidiary, Drill Bit and Tool Co., to the quarry and other nonmetallic minerals industries. It is reported that this one-pass bit is made so inexpensively that it can be thrown away when worn out, instead of being resharpened. Bits are made in a size range from 1¼-2⅝ in., and are claimed to make faster drilling, to assure a smooth clean hole and to prolong bit life.

Classifying Unit

EQUIPMENT ENGINEERS, 41 Sutter St., San Francisco 4, Calif., has in production a Centriclone classifier which employs the forces of the centrifuge and cyclone. Fields of application include: desliming and thickening of flotation feed; sizing of cement plant raw materials; and manufacture of milks of lime and magnesia free from undesired constituents. The company reports that the Centriclone's scope of usefulness is to classify very thick pulps where overflows of high density with 65- to 200-mesh grinds are desired. It is also said that the unit makes sharp cuts in the micron range.



Details of classifier



General view of the dredge and concentrating plant; the latter is mounted on steel pontoons and floats in the lake formed by the dredging operation

SPIRAL CONCENTRATORS FOR GRAVITY SEPARATION OF MINERALS

Electric separators and magnetic equipment also used by Humphreys Gold Corp., Starke, Fla., in processing beach sand deposits to recover ilmenite and zircon

By WALTER B. LENHART

THE TRAIL RIDGE MINE and titanium mineral concentrating plant near Starke, Fla., about 45 miles southwest of Jacksonville, is owned by E. I. du Pont de Nemours & Co. It was built by Humphreys Gold Corp. of Denver, Colo., and is operated by that company for du Pont. About 1200 to 1300 t.p.h. of an ancient beach sand is mined and concentrated for titanium minerals. Humphreys Gold Corp. re-treats this plant's tailing in its own plant for the recovery of zircon, which it does independently of the du Pont operating arrangement.

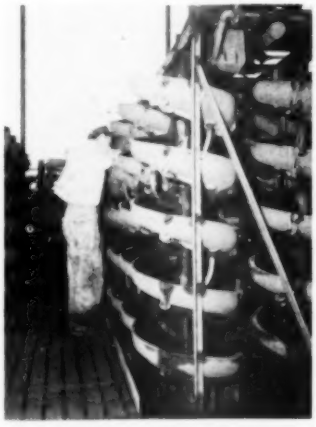
The Trail Ridge plant uses the Humphreys spirals as the primary recovery units. This type of concentrator has many advantages and the possibility of their use in other rock products industries can well be studied, especially by those operators who have coal, lignite and other materials that have a lower specific gravity than the sand being processed, and who are seeking an efficient and simple method of removing the impurities. The spirals can also separate heavier minerals from sand.

At Trail Ridge ilmenite is the principal mineral recovered along with subordinate amounts of leucoxene, a mineral probably derived by alteration from ilmenite. Zircon is also an important mineral at Trail Ridge. Only traces of rutile are present.

The Trail Ridge operation is an extremely portable one as practically all of the processing equipment is mounted on pontoons. The size of this operation shows that the limit of portability in a water-borne processing plant has not been reached even though the pontoon-mounted plant is a large one.

The highlight of the Trail Ridge plant is the use of 1,100 Humphreys spiral concentrators that are all mounted on steel pontoons, so that the plant can be moved easily as the area being mined advances. Here the practice is to pump 600 to 750 ft. from the suction dredge to the plant. About 100 acres per year are mined. The water table in Northern Florida, where this operation is located, ranges from 2 to 20 ft. below grass roots. Tailing water is returned to the dredge pond so that pond make-up water is not required.

In the February, 1949, issue of ROCK PRODUCTS was described the operation of Humphreys Gold Corp. located a short distance east of Jacksonville, Fla. This operation is somewhat similar to the one at Trail Ridge but recovers rutile, in addition to ilmenite and zircon, using a 16-in. suction dredge and 324 spiral concentrators.



The spiral concentrators (5-turn units) require only about 2 x 2 ft. of floor space each. There are 1004 complete units at this operation, mounted on floating rafts

The newer plant at Trail Ridge went into operation in April of 1949, and embodies the general features of the Jacksonville process. At Trail Ridge, a 20-in. Greenville Mfg. Co. suction dredge equipped with a revolving cutting head supplies the concentration plant. A marked difference at Trail Ridge is the use of seven duplex Dorrco rake classifiers to dewater the pulp from the dredge before the pulp goes to the Humphreys spirals. At Jacksonville a special dewatering sump, company designed, was used in place of the Dorrco rakes.

The deposit being dredged at Trail Ridge is a fine silica sand that is practically all minus 48 mesh and which extends north and south for a few miles, ranging from 1000 to 4000 ft. wide. In the June, 1950, issue of ROCK PRODUCTS, J. R. Thoenen, U. S. Bureau of Mines, Tuscaloosa, Ala., described in detail the methods used in sampling this entire deposit.

Minerals

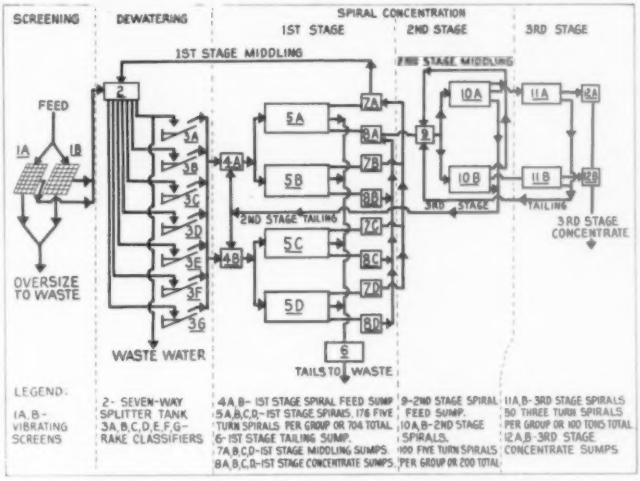
The values in the sand occur as so-called "heavy minerals" that are, in bulk, a deep black color and have specific gravities between 3.5 and 5.0. The valued minerals, all 48 to 150 mesh in size, are recovered in a bulk concentrate by gravity concentration methods. The deposit contains about 4 percent heavy minerals. Ilmenite makes up 45 percent of this heavier portion.

Ilmenite is used chiefly to produce a pigment for the manufacture of paint. It is an iron-titanium oxide of the general formula $FeO{\cdot}TiO_2$. It is weakly magnetic and has a specific gravity of 4.5 to 5.0. Titanium is one of the most abundant elements that make up the earth's crust and during the past decade has assumed great importance as a white pigment, and its use as a metal is an important new development. Despite its abundance, however, it rarely occurs in commercial deposits.

Zircon is zirconium silicate. It is white in color with a specific gravity of 4.7. It is used mainly in high temperature refractories, and specialized uses in foundry work. Small amounts of zirconium metal are used in the electronic field where it acts as a "getter," i.e., a substance used in the manufacture of high vacuum devices for the removal of the last trace of gases, for the metal, when heated, has the property of absorbing large volumes of gases.

In the ancient beach deposits near Starke are also small amounts of kyanite, tourmaline, sillimanite, staurolite, along with lesser amounts of corundum and garnet. The deposit contains very small amounts of economic minerals per ton and the process depends upon working a low cost concentration of heavy minerals into a product that can be further refined by more expensive methods.

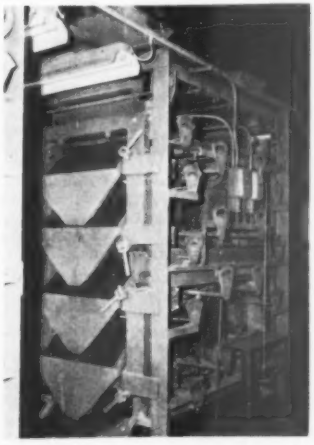
The concentration process consists briefly of making a bulk heavy mineral gravity concentrate from the very low grade ore mined by the dredge, using three stages of Humphreys spiral concentrators. There are 704 spiral concentrators in the rougher stage and 264 and 132, respectively, in cleaner and recleaner stages. The concentrate is pumped ashore to the stationary dry plant for separation into final products by high ten-



General flowsheet of the Trail Ridge plant of Humphreys Gold Corp.



The 1004 spiral concentrators are lined up on the raft in the center



Magnetic separator for separation of ilmenite



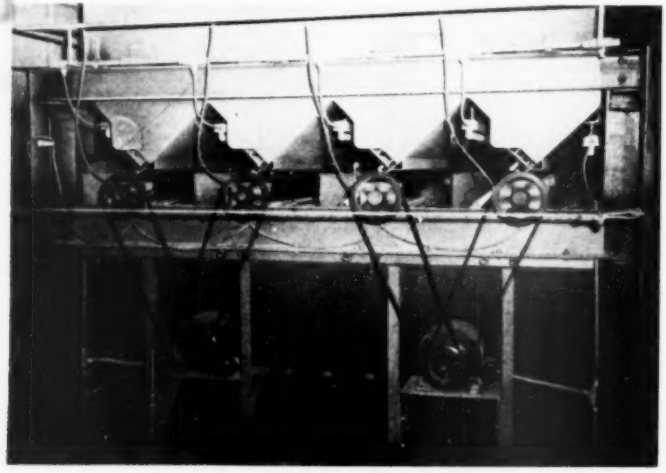
Cutter on the suction dredge raised for inspection



Recorder at left records the density of pulp going to the concentrating plant from the dredge



View of the ilmenite plant. The two dryers are in the building at right. Ilmenite is shipped in closed hopper cars owned by E. I. du Pont de Nemours & Co.



One of the electrostatic separators in the zircon plant

sion electric separators and magnetic equipment.

The spirals are all mounted on pontoons as can be seen from the illustrations. The concentrate is pumped ashore and sent to a small, permanently mounted "scrubbing" plant where the "cons" are first dewatered with a Dorrco rake dewaterer after which the thickened pulp flows to three high speed agitators in series that act as scrubbers to loosen any organic coating or foreign matter from the grains, after which the material drops to another Dorrco dewaterer. This unit unloads to a belt conveyor serving a ground storage pile. The scrubbed and dewatered concentrates on this belt are weighed continuously by a Fairbanks-Morse weighing device.

After draining in the stockpile, the damp concentrate next is binned by a Link-Belt Speedcrane to two steel silos with Hardinge rotary table feeders that feed two Ruggles-Coles dryers.

The dryed bulk concentrate is conveyed to the high tension separators. In this plant there are 28 rougher high tension rotors and 12 cleaner rotors, four residue cleaner rotors and 16 scavenger rotors. In the circuit are four Dings 10-rotor induced roll magnetic separators.

The flow sheet gives the details of how the ilmenite is separated from the "finished residue" and the tailing products, as well as the handling of intermediate or middling products.

The finished tailing portion contains the zircon and small amounts of ilmenite as well as other heavy products. It is pumped to the zircon plant for recovery of zircon. This involves a wet respiral treatment of the material on a bank of Humphreys spiral concentrators, dewatering the concentrate in an Akins classifier and calcining in a rotary oil-fired Vulcan kiln to dry and burn off any organic coating. The few remaining contaminating heavy minerals are removed by high voltage electric equipment and Dings induced roll magnetic separators.

The ilmenite is shipped by rail to Wilmington, Del., in closed hopper cars that are leased by du Pont. The zircon sand is bagged and sold by Humphreys Gold Corp.

Excavation

The deposit of sand at Trail Ridge ranges from 35 to 40 ft. deep with irregular amounts of hardpan, so it is the practice to drill the bank material ahead of the dredge and to blast the hardpan. Light drill rigs are used. The preliminary prospecting indicated that the ore rested on top of a formerly forested surface. Tree stumps in place, broken trunks and an underlying layer of peat, as well as the hardpan, make difficult mining.

The dredge features a 20-in. pump designed and made by the American

Manganese Steel Co. It is driven by a 750-hp. Westinghouse electric motor with direct connections through a John Waldron Corp. steel coupling. Two spuds are used for anchorage purposes. A revolving cutting head on the end of the suction pipe helps break up wood and hardpan to sizes that will enter the pipe. Before reaching the pump, the sand and water mixture with splintered logs and wood trash passes through a "dredge-hog" located in an enlarged section of the suction pipe, where the wood is chopped to small fragments between a heavy revolving toothed shaft and fixed dies.

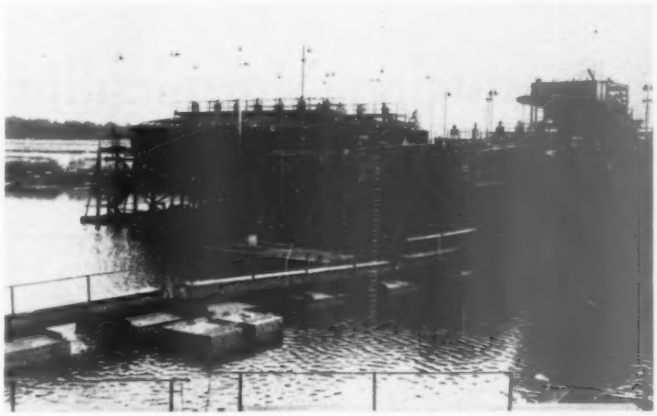
The controls on the dredge include a Hagan Ring Balance meter which measures the weight of solids mined and records tonnages and rate on a Bristol gauge chart. Normally the 20-in. pump handles 10 to 15 percent solids at the rate of 20 tons of solid per minute with a water volume of roughly 16,000 g.p.m.

From the dredge, the pulp is delivered, through a 24-in. pipe line, to two Link-Belt vibrating screens which remove trash and oversize. From the screens, the slurry enters a splitter tank that serves seven Dorrco duplex rake dewaterers which supply two 16-in. Amsco sand pumps feeding the 704 rougher stage Humphreys spirals. The details of the spiral concentration plant can be seen in the accompanying flow diagram.

Spirals

The illustrations also show the general features of the Humphreys spiral. The pulp at 35 to 40 percent solids is fed to the top of the device and as it spirals downward by gravity, a combination of centrifugal force, surface resistance and other factors causes the lighter particles to flow at the outer edge of the stream and heavier particles to go towards the center axis where they are drawn off through ports. The spirals are usually made in five turns per unit, although more (or fewer) turns can be used if desired. It requires three castings per turn, which are bolted together to form the spiral. A five-turn unit weighs about 700 lb. and occupies a floor space of about 2 x 2 ft. They are made in Denver, Colo. Where used in coal cleaning or in the sand industry for removal of heavy minerals or light minerals such as coal, the Humphreys spiral would have a capacity of approximately 2 to 2.5 t.p.h.

At Trail Ridge the roughers make about a 4:1 ratio of concentration. Final ratio of the finished product is approximately 20:1. Up to certain limits a high pulp density does not interfere with the spiral's operation but gives a greater tonnage. Fresh water is usually added to the pulp in the spiral to effect better concentration, but here off-colored water from the pond is used, except on a few spirals that are for control purposes.



Pipe line in foreground delivers pulp from suction dredge to a 7-way splitter that serves the dewaterers. These in turn feed the spiral concentrators

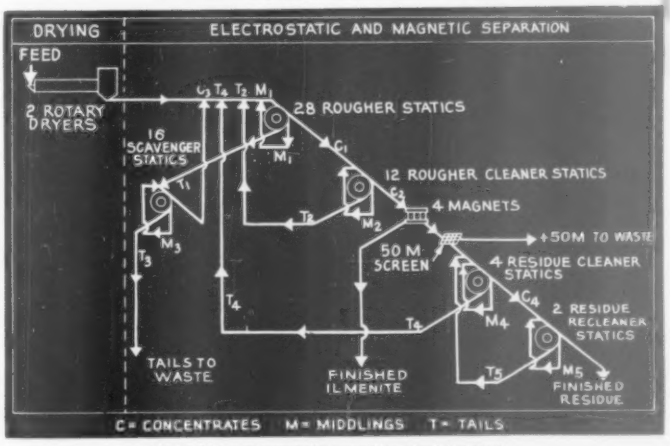
The spirals are cast iron. At the Jacksonville operation and many other applications, the cast iron spirals wear very slowly. At Trail Ridge, however, the sands are unusually abrasive. This characteristic and a low pH pond water have caused unusually rapid wear. Spirals are resurfaced at Trail Ridge when worn with neoprene supplied by Atlas Minerals Products Co., Mertztown, Penn. To apply this product the castings are cleaned by sand blasting and 20 separate coats of the material are sprayed onto the casting to build up a 1/32-in. coating. It is a type of product that could find many uses in the rock products industries. Other types of rubber coatings, sprayed metal coatings, and hard alloy castings are being tried in spirals, launders and other pulp conveying equipment to decrease sand abrasion.

The high tension separators were

(Continued on page 131)



Crude concentrates are fed from the steel silos to the two dryers. A circular plate feeder is used under the silos



Electrostatic and magnetic separation plant flowsheet

Producing Vermiculite Aggregate

Western Mineral Products Co. has highly mechanized plant; makes lightweight aggregate for ready-mixed concrete

ONE OF THE VERMICULITE industry's modern processing plants is in Milwaukee, Wis. It is owned by Western Mineral Products Co. of Minneapolis, processing distributor of Zonolite brand vermiculite products. The firm also owns and operates modern plants at Minneapolis, Omaha and Denver, and serves a trade area of nine states.

The Milwaukee plant occupies only 7000 sq. ft. of floor space, a relatively small area, but it makes for efficient operation. In processing vermiculite, the important thing as far as plant capacity is concerned is to have plenty of ore storage facilities and a furnace that will turn out a good volume. Both needs are amply taken care of at Milwaukee.

This plant was one of the first in the industry to install silos for ore storage. These are of concrete stave construction, four in number, each 32 ft. high. Two are 16 ft. in diameter; two, 14 ft. Total storage capacity is 750 tons of finished vermiculite ore. In the center of the silo cluster is a diamond-shaped pit, 9 ft. deep, which facilitates removal of ore from the silos.

There are railroad spur tracks on both sides of the main building. Thus, loading and unloading can go on simultaneously, or finished products can be loaded out on both sides. Five railroad cars can be loaded at one time.

Mechanized Operation

Unloading and processing vermiculite at Milwaukee is a highly mechanized operation. The ore arrives from Libby, Mont., in railroad box cars containing 50 tons, and is unloaded with a Howell dragline power shovel. The winch is located overhead between two of the silos, 15 ft. above the dock. A steel cable connects with the shovel sheave at dock level, and goes on into the car to a 24- x 32-in. steel scoop. An operator directs the path of the scoop.

The ore is drawn forward through the door of the box car into a track-side hopper, 2½ ft. wide and 8 ft. long. The door of this hopper projects 12 in. under the car to prevent spillage. The entire hopper folds under the dock when not in use.

From the hopper, the ore is picked up by a Nott bucket elevator and carried to the elevator head. The elevator is 57 ft. high and has a capacity of 25 t.p.h. Through control valves, the material is spouted into the various silos, depending on the size of the ore particles. It can also be taken directly to a 5-ton storage hopper within the plant. Two of the silos store ore from which Zonolite fill insulation is processed; one silo, ore for plaster aggregate; and the fourth, ore for concrete aggregate. All the silos have inspection doors at top and bottom so that ore levels can be checked readily. There is also a catwalk on top of the silos for servicing the electric motors.

To remove ore from a silo, a slide valve, or gate, is opened. Through this, the material is spouted into the boot of the bucket elevator and discharged into the plant hopper. A Bin-Dicator bin level indicator automatically starts the elevator when the hopper is low. Another indicator shuts off the elevator when the plant hopper is full. Thus a continuous supply of ore is assured automatically.

From the base of the hopper, the ore is discharged through a specially designed Gump Draver feeder to a 12-in. conveyor belt, 40 ft. long. This



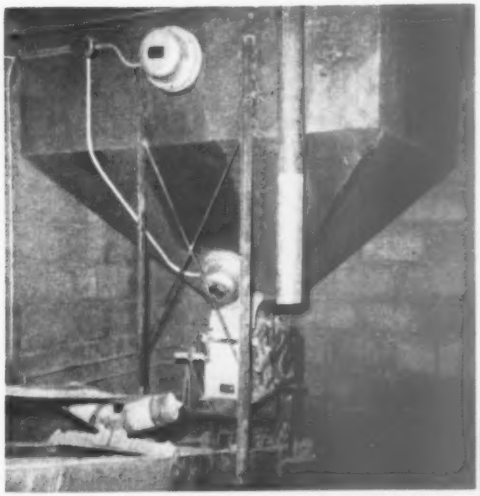
Bagging and sewing operations are the only manual handling of the material from the time it enters the plant



Ore elevator head valves and spouts viewed from silo platform



A gyratory sifter classifies the expanded product from the furnace according to particle size. From the sifter, the vermiculite goes to three bagging hoppers



Ore in the plant hopper discharges to a 12-in. conveyor belt which takes the material to the top of the calcining furnace



The power shovel winch is supported by fence posts and elevator leg 15 ft. above the loading dock and between two of the silos

takes the material to the top of the calcining furnace, 16 ft. above the ground floor. A suction blower collects dust created as the ore enters the conveyor.

Processing Expanded Vermiculite

The furnace is the Zonolite Co. Model A type, and is equipped with two Industrial multiple spray burners, which maintain a temperature of 2000 deg. F. The crude ore cascades from the top of the furnace over a series of baffles and passes directly through the flames to the bottom of the furnace. The intense heat releases water molecules trapped within the material and between its laminations, causing the layers to separate and expand to from 12 to 15 times their original size. The color of the mineral changes from dark gray to glistening gold, and the expanded product is extremely lightweight and fluffy.

From the furnace the material is taken by another bucket elevator into a cyclone airlift. This has three functions. It removes any rock particles that may be contained in the expanded material. It cools the product preparatory to bagging. It elevates the product for further processing. From the airlift, the product is discharged through a rotary valve into an Allis-Chalmers gyratory sifter that classifies the product according to particle size. From the sifter, the vermiculite goes into three bagging hoppers. The entire operation, from ore in the silo to the bagged product, requires only about 3 minutes. Capacity of the furnace and accessory equipment is eighty 4-cu. ft. bags of finished products per hour.

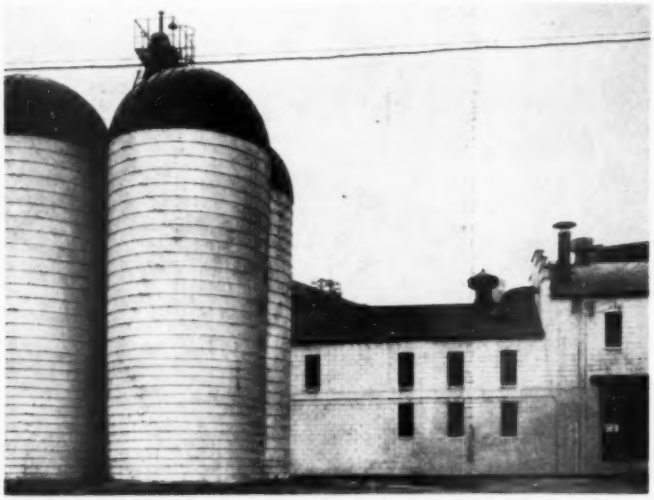
Bagging is the only manual handling of the material from the time it leaves the boxcar. As the paper bags are filled, their content is mechanically metered on a volume basis. Bags are neatly sewn shut on a power Union Special sewing machine, mounted on castors, at one side of the bagging hoppers. Finished products are placed on wheel pallets and either taken to storage or to the outside concrete loading dock. The dock, 15 x 80 ft., is large enough to accommodate three boxcars, two trailers, and a pickup truck at one time.

Zonolite acoustical plastic (a premixed material containing special ingredients) is produced in a Marion mixer suspended from the first floor ceiling. Ingredients are added to the mixer from the second floor and the finished product is bagged on the main floor.

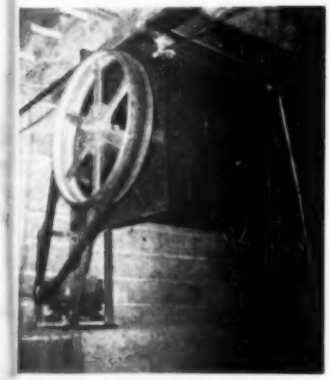
Lightweight Ready Mix

Zonolite concrete aggregate is treated with a powdered stabilizing admixture, integrally mixed with the aggregate. For this product, there is another bagging hopper on the second floor used in connection with loading ready-mixed concrete trucks. Bags are not closed, but are placed open on the storage floor near a hopper equipped with an outside spout. Ready-mix trucks arrive with the proper charge of cement and water, already mixed, and back under the spout. The necessary number of bags of Zonolite concrete aggregate are dumped into the hopper, and the truck is ready to go in about 5 minutes.

This type of loading was started only recently with a 7000 bag order for Central Ready-Mixed Concrete Co. of Milwaukee, which had a large job for Miller Brewing Co. Specifications called for a 1:6 mix, so the trucks arrived with a slurry made of five bags standard portland cement and 75 to 80 gal. of water per cu. yd. to get a 4-in. slump. Seven and one-half bags of Zonolite concrete aggregate for each cubic yard were dumped into the mixer and mixed for 3 min-



Three of the four silos of Western Mineral Products Co. Milwaukee plant. Portion of the plant is in the background



Premixed acoustical plastic is produced in a mixer suspended from the first floor ceiling. Ingredients are added to the mixer from the second floor and the finished product bagged on the first floor

utes. Mixers were high discharge 4½-cu. yd. Rex units, with the drum making about 40 r.p.m. On the job, the concrete was discharged into buckets and taken up to the floor by elevator; 60 to 80 cu. yd. of concrete were placed per day. No difficulty at all was experienced with yields.

The loading system at Western Mineral worked well and is used regularly by ready-mixed concrete firms. It is particularly serviceable to the ready-mix operator with little storage space for aggregate.

Terra-Lite brand vermiculite, specially sized for horticultural use, is bagged from a hopper charged from the second floor and equipped with metering valves that will fill two different sizes of bags to proper volume. Actual bagging is done on the main floor. The filled bags are placed in baler boxes.

New Developments

Back in 1944, small as it was at that time, Western Mineral was the world's largest processor of vermiculite products. Problems that attended the industry's growth were first felt by it; and, by necessity, the company pioneered many technological improvements.

"We first developed a suitable means of cooling the material to reduce bag breakage and step up production," C. A. Pratt, vice-president in charge of production, explained. "We were the first vermiculite processor to screen the expanded product satisfactorily. Next came the use of powdered admixture for treating concrete aggregate, making liquid admix waterproofing unnecessary. We developed a machine for an attractive, strong sewn bag closure, although sewing had been attempted and abandoned by three other vermiculite producers. We also developed the accurate metering device on a volume basis for controlling bag content."

In addition to Zonolite and Terra-Lite products, Western Mineral processes Z-Crete for insulating underground steam lines; Sani-Flor, a vermiculite poultry litter; and San-A-Pan used in the battery production of chicks and turkey poults.

At a recent stockholders' meeting, president L. J. Venard announced that the fiscal year of 1950 showed a sales increase of 33⅓ percent compared with 1949, which was itself a record year.

The Milwaukee plant serves Wisconsin and the Michigan Peninsula. Q. Q. Carey is district sales manager there, and Lee Draper is plant superintendent. H. W. Steiff is vice-president in charge of sales for Western and L. D. Jorgensen, secretary.

California Talc Deposits

THE STATE OF CALIFORNIA, Department of Natural Resources, Division of Mines, has issued a special report, "Talc Deposits of Steatite Grade, Inyo County, California," by Ben M. Page, and prepared in cooperation with the U. S. Geological Survey.

Steatite is exceptionally pure talc, generally understood to contain less than 1.5 percent CaO, less than 1.5 percent Fe_2O_3, and only minute amounts of other chemical and mineral impurities. California continues to lead in the production of domestic steatite, with all deposits in the state in Inyo county. Talc of near-steatite quality occurs in other California counties, but has not proved acceptable to manufacturers of high-frequency insulators, for which steatite is used.

At the end of 1942 the known steatite reserves of Inyo county were estimated to be only 86,700 tons and the rate of production was computed to be equivalent to about 15,000 tons annually. Production slackened somewhat, and exploration and development since 1942 have revealed substantial tonnages of steatite which tend to maintain known reserves. The report states, however, that the supply of Inyo county steatite is seriously limited.

Many of the county's steatite deposits are geologically similar in some respects. Limestone is the most prevalent original rock but massive dolomite of hydrothermal origin has replaced the limestone in areas measuring hundreds or thousands of feet in width, with the unaltered limestone remnants occurring as "islands." Silica rock resembling quartzite also forms islands, and the talc deposits are commonly ragged, elongated, steeply-dipping bodies in the massive dolomite or silica rock. They are of hydrothermal origin generally centered at lithologic contacts where some differential movement has occurred, but some are localized by faults or minor shears within a single rock type.

Although California leads in domestic production, other western states began to produce steatite during and after World War II. In 1946, California yielded 9600 tons; Nevada was in second place with 6000 tons; Montana was third; and New Mexico reported some production.

Crushed Stone Plant

LYCOMING SILICA CO., Salona, Penn., which recently bought the Salona stone quarry from Bellefonte Lime Co., has added new buildings and installed three new crushers.

EVALUATION AND DEVELOPMENT OF KILN EFFICIENCIES

Part IX. Evaluating radiation loss from rotary kilns

By VICTOR J. AZBE*

IN THE INITIAL ISSUE of this series, (ROCK PRODUCTS, April, 1951, page 113) the heat balance and also the lime loss balance were discussed and illustrated. Of the various losses, that due to calcining zone terminal temperature differential proved to be the most serious. Next was the loss due to kiln external radiations and third the cooler loss. There was virtually no stack loss as such. The prime source of this loss centers in all of the other heat losses.

Heat Loss Due to Radiation

While radiation loss was 13.6 percent of the total heat of the fuel, this, evaluated by a proper thermal accounting method, proved to be 72.6 percent of the actual lime output, seemingly an entirely new method of evaluation, bringing into proper perspective the true magnitude of the loss.

With this being so, it becomes quite plain that whatever we do to the rotary kiln will not make it an efficient machine unless along with other losses, we also reduce the loss due to external radiation. There has been little effort expended to do this. If anything, the tendency was toward increasing rather than reducing this loss. It was virtually assumed that any substantial reduction was impossible of practical accomplishment, that an approximate 15 percent loss must be suffered, and, since it was only 15 percent, that it did no serious harm.

Actually this is not so. The loss is not 15 percent but close to 80 percent and a great deal can be done to reduce it.

Most of the heat lost by radiation, and, in the case of many rotary kilns, all of it, is heat of high elevation. In addition, it is transferred heat ready to pass into lime if it was not lost through the wall. Due to this, an increased amount is lost up the stack, which being due to radiation loss, should be charged to radiation loss.

It is similar to the effect of the cooler. Recuperative cooling of lime will reduce stack temperature and reduction of radiation will do so also—even more so, because in this case it is partially transferred heat.

This is portrayed by the two sketches in Fig. 33. In either case the more there is of "A" the more there will be of "B," and if a "C" portion is saved then a quantitatively related "D" portion is also saved.

Radiation is a matter of surface exposed, nature of external exposure, and of surface temperature. It is, in turn, a matter of inside wall surface temperature, of wall thickness and conductivity. It is a matter of external surface exposed in relation to internal volume, of radiant activity within this volume and velocity of gases over the surfaces internally and also of air velocity externally.

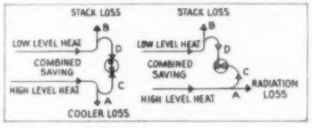


Fig. 33: Loss due to non-recuperative cooling (left); loss due to radiation (right)

In rotary kilns, conditions are almost ideal for heat loss by radiation. Over 50 percent of the heat that enters the material was transferred through the medium of the wall. This is done either by radiation from the wall to the lime or by conduction between the wall and the lime during the time the two are in contact. The wall surface is close to the average of the flame temperature, somewhat lower than flame temperature but not greatly so. The wall is usually only 6 in. thick or less, at times only a couple of inches, and virtually always uninsulated.

So-called radiation loss from outer surfaces of kilns, hoods, coolers, gas producers, gas ducts, hot air or recirculating pipe consists of the radiation loss proper and of convection loss.

The radiation component depends on the temperature of the exposed surface and its emissivity, which for brick or dark iron surfaces is 0.9 or higher and for bright surfaces such as aluminum painted surfaces as low as 0.5 or even less.

The radiation loss component is almost always higher than the companion convection loss and it tends to increase rapidly with the temperature rise of the surface, quadrupling for the mere doubling of surface temperature.

The convection component is also governed by surface temperature but in more direct ratio. In addition it is governed by air velocity past the surface. Thus the total loss from a rotary or vertical kiln having an outside exposure would be considerably greater at higher wind velocity and would vary about as follows:

Wind velocity, m.p.h.	4	8	12	16	20
Ratio of radiation loss	1.45	1.65	1.93	2.11	2.28

It would seem that aluminum painting of kiln surfaces, since it changes the emissivity factor so greatly, would be conducive to saving of considerable heat. It does save some, but not much because through such lowering of emissivity the surface temperature increases and the saving accomplished is only that due to reduction of temperature difference between inner and outer wall.

In general, what affects the heat loss from surfaces is exposure and the wall heat transfer capacity. This latter is a matter of thickness and conductivity of the separate wall portions.

Determining Radiation Loss

In the determination of radiation loss we thus have two approaches open. The first is through determination of surface temperature and corresponding loss obtained from published data. To determine surface temperature correctly, however, is not exactly simple; it is quite a chore and is seldom done right. Therefore, actual heat losses are usually greater than determined by this method. Also, the higher the wind velocity the lower will be the kiln surface temperature, while the actual wall transfer will be greater, resulting again in a low value of estimated loss.

A much safer way is to evaluate the loss from data on wall thickness, its conductivity, and its internal surface temperature. To aid in this, heat loss tables are to be found in many text books and refractory catalogs. This method is also preferable because one should distinguish between loss by radiation of high level heat above 1500 deg. F. and of lower level heat. Surface temperature method does not give any inkling of this. Surface temperature may be high because the wall is thin; the loss may be considerable, but may be of low level heat doomed to be wasted at the stack.

However, the two obtained correctly with suitable allowances for exter-

*Azbe Corp., St. Louis, Mo.

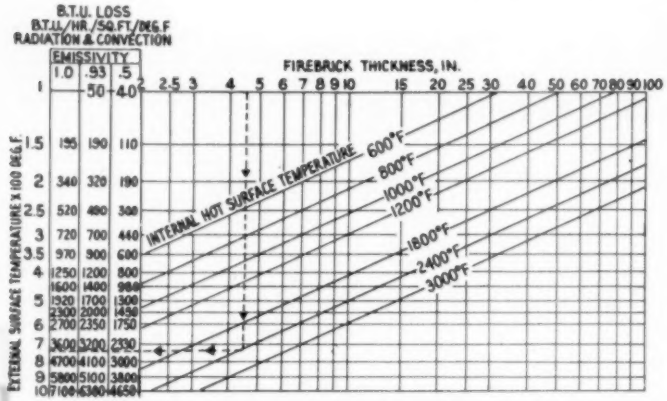


Fig. 34: Radiation and convection loss from wall surface to air at 70 deg. F.

nal rate of air flow are interdependent and are presented in this manner in Fig. 34. The chart features an example by means of dotted lines. If a rotary kiln wall is 4½ in. thick and internal surface temperature 2400 deg. F., then the heat loss per sq. ft. of surface is slightly greater than 3200 B.t.u. per hr. At this loss, and 0.93 emissivity, surface temperature should be 720 deg. F. under low external air flow conditions. It may not be found to be this for reasons stated above.

Reducing Radiation Loss

Fig. 35 shows how greatly the radiation loss increases as the brick thins out from 6 to 4 in. and occasionally to 2½ in. found in some rotary kiln operations, and how greatly it reduces when insulation is applied in some such manner as shown by Fig. 36. In vertical kilns, where it is needed less, insulation can be applied readily and properly. In rotary kiln practice, application is difficult and of questionable value. The soft insulating brick is subject to torsions and compressions. It then becomes compacted and loses its insulating value. It also loosens the wall as a whole and may be the the cause of falling out of refractory brick and kiln shutdowns. So while insulation of rotary sections is somewhat questionable, that of any static wall at the hood is not.

Insulation is desired in the case of hot air ducts between the mill and the kiln. Their temperature may be low, but the heat loss is of high elevation and, with the pipe walls thin and bare, heat loss may still amount to a quantity well worth saving. The loss for various surface temperatures is as follows:

Radiation loss from bare pipes

Surface temperature, deg. F.	100	200	300	400	500	600
Loss B.t.u./sq. ft./hr.	50	300	680	1220	1880	2650

Radiation loss may be reduced quite

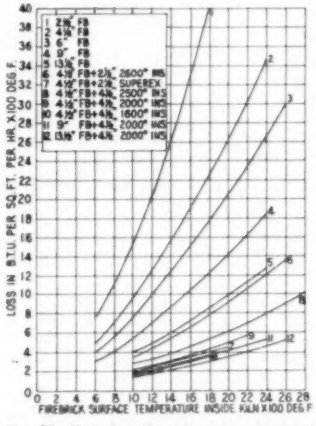


Fig. 35: Heat loss through various insulated and uninsulated wall thicknesses

substantially by an increase of kiln capacity, and all kilns through one or another means are subject to capacity increase. Radiation loss will be somewhere near to being inversely proportional, so if capacity is raised from 170 to 240 tons radiation will be reduced from 1 to 0.71 or at least by 25 percent.

Radiation can be further and most substantially reduced by creating a thermal intercept at the beginning of the calcining zone wherein the gases will be rapidly cooled, resulting in that in the rear 50 percent of the kiln length the heat loss will be that of low elevation and of relatively lower value. Only from the hot half of the kiln will high value heat be lost and even that loss can be minimized through increased capacity.

In our original example, the 10,000,000 B.t.u. rotary with 1550 deg. F. stack temperature, radiation loss was 1890 B.t.u. or 13.6 percent of the 13,918 B.t.u. high heat value of one lb. of coal. The heat loss was all of high heat value and all transferred. By means of quadrant intercept introduction and combined with an inincrease of capacity, the high level radiation loss would be reduced to 0.75 x 0.50 x 100 = 37.5 percent or to only 708 B.t.u., a reduction of 1182 B.t.u.

Through this saving, the low level heat component is saved as well, making for a total of 1182 x 1.4 = 1655 B.t.u. and $\frac{1655}{1378 \times 0.95}$ = 1.26 lb. of additional lime.

We did not do any insulating, but we raised the capacity and confined the high level heat to shorter kiln length. While radiation still continued, we saved virtually the equivalent of the original amount. It is not magic, it is just conservation of heat of high elevation for the purpose intended.

Through the insertion of quadrants and conversion of a portion of the kiln from a sluggish into an active heat absorption unit, we did even more, since with the reduction of radiation we also reduced the calcining zone terminal temperature differential.

It is this which reveals the fallacy of locating the stone preheaters at ends of the kilns, causing a higher radiation loss due to a higher temperature of the entire kiln length and similarly the fallacy of long kilns whose extra length is a stone preheater also, tending to raise the temperature and radiation loss within the normal length of the kiln.

In the above we considered only a normal length kiln of normal diameter of limited extent of quadrant application. If kilns would be reduced in both length and in diameter and quadrated more extensively, internal hot zone temperature would be reduced, and with this radiation as well. Insulation of the hot zone would then also become more practical, thus still further reducing radiation loss.

Fig. 37 presents contrasts of temperature gradients of an ordinary

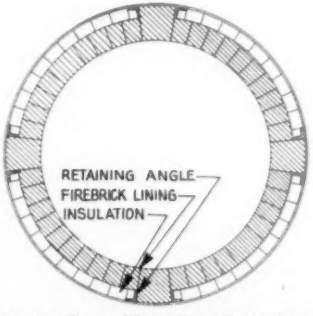


Fig. 36: Rotary kiln section with insulated lining

open 175-ft. kiln, with those of a well-quadrated intensive heat absorption kiln. In one case heat absorption surface is limited and so high temperatures are both the result as well as the requirement. In the other case there is ample surface and better exposure, so high temperatures are neither needed nor can they be normally attained. In one case high level radiation will extend to the end of the kiln, in the other it will be limited to only about the initial 77 ft.

The article published in ROCK PRODUCTS by the author in March, 1950, entitled "New Concept of Rotary Kiln Plants," dwells at length on the essentials of design of the rotary kiln toward creation of such an intensive absorption unit.

Recuperative Cooling of Lime and Clinker

The writer has emphasized and re-emphasized the importance of recuperative cooling of lime.

At the 1937 meeting of the National Lime Association in Chicago he stated, "There are any number of rotary kilns in operation in which the sensible heat of the lime is not recovered at all. In other cases lime is cooled in uninsulated rotary shell coolers, which tend to accomplish the cooling in a degree, but this is not recuperatively as most of the heat abstracted is dissipated by radiation before it can return to the kiln."

Unfortunately, to a considerable extent, this is still true today. Neither in cement nor in the lime field is the subject given the attention that it merits. It is seldom that the cooler is considered in efficiency as an individual unit, most always being thought of as an adjunct of secondary importance.

There are coolers that cool effectively, but this is done on otherwise inefficient installations when much fuel is burned for the lime or cement made and thus much air is made available to do the cooling. Rotary kilns have a thermal efficiency of only half of what they should have, at which there would be only half the air to do the cooling, when all coolers would fail, except in the case of the true counter current heat flow contact cooler of proper design.

Fig. 38 presents a series of charts

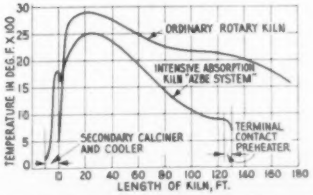


Fig. 37: Contrasting temperature gradients of ordinary and high absorption rotary kilns

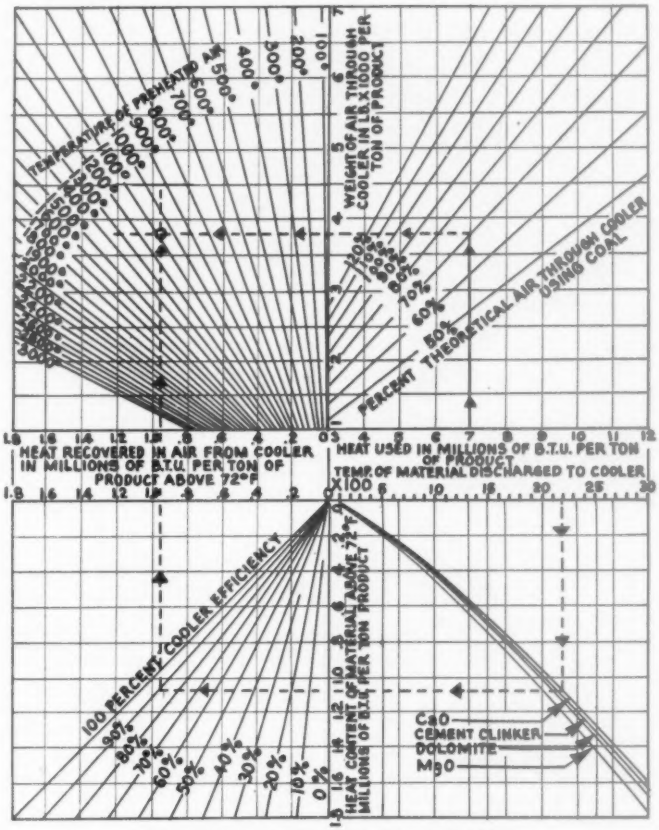


Fig. 38: Lime and clinker cooler performance charts

interestingly revealing cooler capacity to recover or waste heat. There is a dotted example line, starting at the temperature of the product being discharged from the kiln and leading to the nature of the product, which may be high calcium lime, cement clinker, dolomite or magnesite. The example is for high calcium lime. Discharge temperature is 2200 deg. F. and, following the line, it shows that the heat content of the material discharging is 1.07 million B.t.u. per ton of product.

If the ratio of lime to fuel would be 3:1 and no cooler used, then the sensible heat loss would be the total of 1.03 x 3 = 3.09 million B.t.u. per ton of coal.

If there is a cooler, the loss or recovery, respectively, will depend on the cooler efficiency which may range from virtually nothing up to around 90 percent. In case of 90 percent efficiency, heat recovered would be 927,000 B.t.u. per ton of product. This heat would preheat the air; the amount of air passing through the cooler.

Reverting to the upper line at the right, the example assumes a kiln using 7,000,000 B.t.u. per ton of product and that 70 percent of the air required to produce this heat passes through the cooler. In this case this would mean 3790 lb. of air per ton of product. Extending this line to where it meets the line of heat recovered, the point of intersection indicates the air temperature attained. It is 1080 deg. F. If temperature obtained would have been only 600 deg. F. it would have revealed that cooler efficiency was only 47 percent.

Since the 927,000 B.t.u. recovered is high level heat the total saving of high and low in terms of lime would be:

$$\frac{927{,}000 \times 1.4}{1378} = 941 \text{ lb. of lime or}$$

$$\frac{941}{200} \times 100 = 47 \text{ percent of production}$$

(Continued on page 136)



Boonesboro plant, Kentucky Stone Co., is located on the banks of the Kentucky river; portals to limestone mine in background

New plants built by Kentucky Stone Co., Reed Crushed Stone Co., and Rogers & Brunnhoeffer to supply expanding market

By WALTER B. LENHART

KENTUCKY CRUSHED STONE INDUSTRY EXPANDS

TWO THINGS HAVE had a marked influence on the recent developments of the crushed stone industry in the state of Kentucky: atomic energy and the Kentucky Derby. The latter, through the influx of out-of-state visitors, has made the state tourist-conscious. The area has much to offer to the scenic-minded traveler, but little in the way of adequate highways. There are a few intercity highways that are equal or above average, such as those connecting Louisville to Lexington, and Lexington to Nashville, Tenn. However, for every good road we found several bad ones.

Casual inquiries to determine the reason for some of the poor roads, particularly black-top pavements with deep pot-holes, brought forth a relatively new alibi. "Winter kill" was the explanation. Kentucky and Tennessee did have an unusually cold winter in 1950-51, so the roads are classed by the citizens with the lilacs and dogwood. However, we got the impression that the roads were bad because of poor construction. Judging from the construction work going on throughout the state corrective measures are being rapidly applied. The newspapers, especially in Louisville, are hammering away for better highways and city streets as a prerequisite for attracting tourists.

The second part of the general subject, atomic energy developments, has a powerful impact upon us, since the pattern of a new life is in the making.

In Paducah, Ky., there is a relatively small atomic energy development, the initial spending by the AEC being a half billion dollars. However, a new $200,000,000 TVA steam plant is being erected on the Kentucky side, and another private utility operation on the Illinois side to develop electrical energy. Evidently electrical power in the Paducah area will be important for one must not overlook the TVA water power from nearby Kentucky dam.



Wagon drill operating on quarry ledge. Rogers & Brunnhoeffer plant

Just how much crushed stone, sand and gravel and related rock products will be used is a difficult question. Undoubtedly, it will be a large amount and at the outset road construction within the area is the first major project. One new crushed stone operation has been set up at Gilbertsville, some 42 miles from the project and this is said to be the nearest source of crushed stone. A second crushed stone plant was reported to be a possibility, and a new concrete masonry plant of large capacity is also being built in Paducah. Several men seem to think that aggregates in sufficient amounts will "pour" in from outside points, from Illinois and distant parts of Kentucky. Trucking sand southward and returning northward with a load of crushed rock is one evidence of the pouring in of construction materials.

In another section of the United States there is another new atomic development slightly larger than the Kentucky project. At this un-named development, a large crushed stone producer just outside the shipping area said, "It will take ten plants the size of mine to supply the need." The area is adequately provided with aggregate plants, yet in the shipping area are four new plants along with enlargement of older plants, preparing for the business that atomic energy



Semi-portable steel plant of Kentucky Stone Co. at Boonesboro; A-frame at right supports a magnet for removal of tramp iron

development brings. The plants now operating in both districts have almost all the business they can handle easily so that a shift is predicted in the productive balance when the AEC moves in.

In a general sense, Kentucky has two sources of aggregate. To the north the Ohio river supplies sand and gravel, but back in the hinterland, crushed stone is prevalent. Good limestone is a widespread commodity and in the better agricultural and industrial sections crushed stone plants are numerous. In one area, within a radius of less than 20 miles, we visited six plants and were told of two more. This was a section that was essentially agricultural and sales of agricultural limestone played an important part in the economic structure. The plants are all relatively small, in the 100-150 t.p.h. range, and operate dry. Trucking by contractors accounts for transportation to market for most of the tonnage produced. The fine aggregate used, for the most part, is sand from the Ohio river. No plants make a crushed stone or "manufactured" sand, although one producer is thinking in terms of a washed limestone sand as a possible future addition to his production. Underground mining, using trucks and "room and pillar" methods, appears to be popular in hilly sections. Older plants are of wooden construction, for the most part, but three new ones, of the semi-portable type, are of steel construction. None of the plants is dustless. In the new plants, additional facilities for agstone production are either already in service or are contemplated, with hammermills and cone crushers with fine bowls vying to produce the finer sizes.

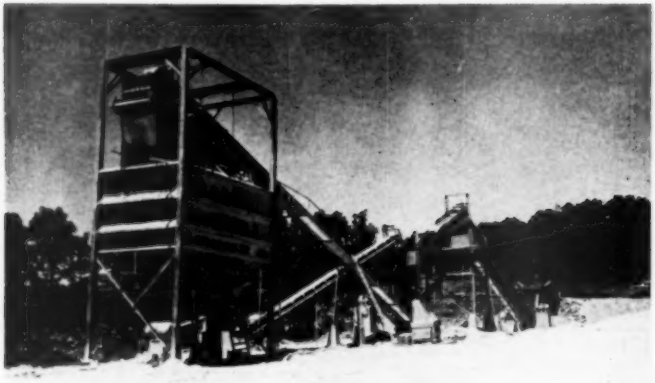
While the newer plants are semi-portable, one producer hinted that if price cutting in his section got out of control he would buy a portable



Quarry is very close to the state highway. Loading is done by ¾-cu. yd. shovel to end-dump trucks. Rogers & Brunnhoeffer plant



The crushing and screening plant is very compact. At left is the primary jaw crusher and pan feeder, and at right are the secondary crusher and storage bins. Rogers & Brunnhoeffer plant



Reed Crushed Stone Co. plant is semi-portable in design



General view of Reed Crushed Stone Co. quarry. Some earth and about 12 ft. of rock is stripped to get to commercial stone below

unit and move to another part of Kentucky where prices are higher and more stable. Thus his proposed plant would be used as a traveling club to fight price cutting.

Kentucky Stone Co.

Kentucky Stone Co. is the largest producer of crushed stone in the state. With the acquisition of the Elkton plant, over a year ago, and the building of a new operation at Boonesboro, the company has a total of 11 plants, nine of which are underground operations. The operation at Tyrone uses a shaft that was the outgrowth of a type of mining similar to that now practiced at Boonesboro. Elkton is between Hopkinsville and Russellville, in an area rich in agricultural resources. There are many crushed stone operations, and agstone spreader trucks are a common sight on all highways in the area.

The Boonesboro plant is typical of the newer production units in the state. Boonesboro is on the Kentucky river, about 22 miles south of Lexington, midway between Richmond and Winchester. In a high bluff of limestone that forms the west wall of the Kentucky river underground mining of stone is carried on, using the room and pillar system. The plant is a semi-portable Cedarapids unit using a 25- x 40-in. jaw crusher as the primary crusher, and a 3240 hammermill as secondary.

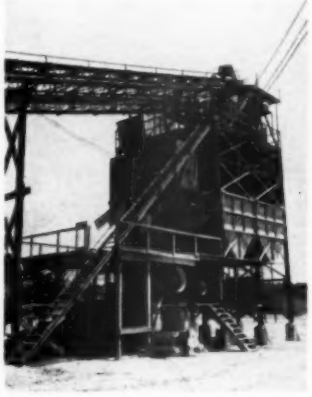
In the mine, two portals have been opened to reach nonconnected mine areas. Rooms are 50 x 50 ft. with pillars of similar size to support the backs. Drilling is by two Ingersoll-Rand heavy drifters mounted on a "jumbo" that is assembled on the back end of a truck. The face drilled is 26 ft. high, so that ample room is afforded for the Bucyrus-Erie 22-B electric shovel to operate. Three Koehring Dumptors haul the stone to the primary crusher, a distance of possibly 300-400 ft. Air is supplied by an 800-c.f.m. Joy compressor, and Hercules powder and electric exploders are used. A Dings magnet is mounted over the offbearing belt, from the primary crusher, by the use of a timber-constructed A-frame. Ground stored material is reclaimed by a Hough front-end loader.

The plant is neatly assembled and mounted on concrete pillars with semi-portable bins for truck loading. It is a dry operation and has a capacity of 150 t.p.h. No railroad serves this plant.

The main offices of the company are in Louisville. Raymond A. Matthews is president and Verne Morgan is secretary. Chester Halcomb is superintendent of the Boonesboro operation.

Rogers & Brunnhoeffer

The new Kentucky plant of Rogers & Brunnhoeffer is located on Highway 62 near the west edge of the town of Leitchfield, 56 miles west of Bardstown. Ralph Rogers, president of the company, has other operations in Illinois and is active in the construction field.



Secondary crusher is a 4½-ft. cone crusher. Provisions have been made to install a second cone crusher alongside the present one (chute at left). Rogers & Brunnhoeffer plant

The Leitchfield operation is more of a permanent plant than some newer Kentucky operations. However, it is of steel construction and would present no great problem should the owners wish to move to another site. The plant operates dry and features the use of a 26- x 36-in. Traylor jaw crusher fed by a heavy-duty apron feeder of the same make. There are two 14- x 6-ft. double-deck Robins screens mounted over the parabolic bins, but at the time of inspection only one was in use. A 4½-ft. Symons cone crusher is the second and final reduction unit. Provisions have been made for installing another crusher, or hammermill, alongside the cone.

There are two parallel inclined belts angling off from the vicinity of the primary crusher. One offbears from the primary crusher and delivers to the Robins screen. Oversize is chuted to one crusher and a stub conveyor belt, plus an inclined return belt, return the material to one or both of the two parallel belts. Thus all, or a part, of the crushed rock is sent back to the second vibrating screen. Oversize from it will be chuted back to a third reduction unit that may be installed later.

Under the cone crusher is a short stub conveyor that serves the main return belt. It is equipped with an American speed reduction unit belted to the General Electric drive motor. The primary crusher is provided with water-cooled bearings, and a small piston-type pump is V-belted from its main shaft. Both of these methods make a compact and efficient installation.

The company formerly operated a small plant, now out of service, across the highway from the present one. No

rails serve the plant and all haulage is by contract trucks with material being weighed on a Winslow truck scale. Lewis Bishop is scaleman and bookkeeper.

In the quarry, a "365" Gardner-Denver compressor supplies air for the Ingersoll-Rand wagon drill. Holes are spaced in conventional patterns and are filled with 60 percent Atlas gelatine, with Atlas electric delays used for firing. Primary loading is by a ¾-cu. yd. Lima shovel. Two Euclid rear-dump trucks haul to the crusher, a distance of approximately 500 ft. over easy grades. An RD-8 Caterpillar tractor with dozer blade is used, from time to time, to keep the quarry floor clean. Agstone plays an important and growing part in the sales picture of this neat and efficient plant. The plant has an average output of 125 t.p.h. Excess material from the plant is ground stored and reclaimed by a Haiss loader. W. W. Petitt is superintendent at Leitchfield.

Reed Crushed Stone Co.

The new plant of Reed Crushed Stone Co. is at Gilbertsville, Ky., about two miles north of the northern end of Kentucky dam. It is approximately 24 miles from Paducah and 42 miles from the atomic energy development. This quarry and another owned by a different concern are about as close to the AEC work as possible. It was said, on the Kentucky side at least, that there is no other stone available that is suitable for commercial material.

Reed Crushed Stone Co. is owned by Clyde Reed, who conducts a coal mining and trucking business in western Kentucky. His entry into the crushed stone industry was the result of a desire to have an enterprise that would not be as seasonal as coal mining. He acquired the quarry site several years ago and for some time made a survey of market conditions, sizes of stone best sold, etc., but did not construct a plant until this year. When TVA opened the highway over the top of Kentucky dam for public use, this road made available a large market area which was a big factor in the decision to go ahead with the plant.

The plant is semi-portable in design and uses a 24- x 36-in. Cedarapids jaw crusher fed by a heavy-duty apron feeder of the same manufacture. The secondary crusher is a 3-ft. Symons cone and the final reduction unit is a 3032 Cedarapids hammermill. Agstone, as in the case of most Kentucky stone plants, plays an important role in sales. The set-up of the hammermill is such that crushed stone from the finish bin can be conveyed directly to the hammermill and the ground product returned to the finish screen by a return belt serving the main belt. There are two Simplicity vibrating screens in the plant. The scalper is a 3- x 10-ft. unit and the finish screen is 14 x 4 ft.

(Continued on page 137)



Portable crushing plant in operation, being loaded by a ¾-cu. yd. shovel

FIVE QUARRIES SERVE PORTABLE PLANT

DELL NEEDHAM, Fennimore, Wis., producer of crushed limestone aggregates, operates portable plant equipment and, in an average year, operates at five different quarry locations.

The quarry being operated by the company at present is a hill in southwestern Wisconsin; the deposit is partially fragmented, with a horizontal layer of blue limestone about 2 ft. in depth appearing across the face.

Overburden at this deposit presents a minor problem, averaging an inch or less in depth. It is removed with an International TD-9 tractor fitted with an Isaacson dozer. This same tractor is used for general cleanup around the plant, in building quarry roads, and in spotting a Worthington wagon drill that is used in preparing blast holes.

Drilling practice at this operation consists of drilling vertical holes to 18 ft. depth with a 6-ft. burden, spaced at 8-ft. intervals. Additional blast holes required to bring down the 30-ft. face are driven horizontally into the face at a point about 3 ft. above the quarry floor. All holes are charged with Illinois powder and the charge is fired by battery, the top holes being fired first. This method of drilling blast holes allows the operator to bring down a high face without handling heavy 24-ft. drill steel. Quarry floor at the operation is extremely smooth. A Chicago Pneumatic 315-c.f.m. truck-mounted compressor supplies air for the wagon drill, as well as for the jackhammers used in the quarry for a small amount of secondary blasting.

Stone is loaded directly to a 3-cu. yd. plant hopper by a ¾-cu. yd. Northwest shovel powered by a Chrysler gasoline industrial engine. The portable plant and all machinery in it with the exception of the jaw crusher were built by Wisconsin Foundry & Machine Co. The 15- x 24-in. jaw crusher was made by Diamond Iron Works. Quarry-run stone is fed from the hopper to the primary reduction unit by an apron feeder. Minus 2½-in. discharge from the jaw crusher is transferred to an elevator wheel by a belt conveyor and from the elevator to a 3- x 8-ft. vibrating screen by a second belt conveyor. This double-deck screen has 2- and 1-in. mesh on the upper and lower deck, respectively. The top deck serves as a wear absorber. Oversize from both decks is chuted to a 30-in. set of rolls. Minus 1-in. discharge from the rolls is conveyed to the elevator by the first belt and returned to the screen in closed circuit.

A 2-cu. yd. hopper is located under the screen to receive throughs from the bottom deck. A truck-loading belt conveyor extends from under this hopper to one side of the plant. All power for plant operation is produced by an International UD-18A diesel engine, rated at 125 hp. Movement of the plant within a quarry is accomplished with a Mack tractor, but haulage from quarry to quarry, frequently up or down steep roads, is done by a contract hauler.

Other equipment used at this operation includes a Hobart 200-amp. portable welder mounted on a Ford truck, and a model 50 Adams motor grader. Frequently the power shovel, grader and dozer are used on small contract jobs when not required at the quarry.

SAND MORTAR STRENGTH INFLUENCED MOST BY GRADING

Test data indicate that strengths vary according to properties of different sands

THE RESULTS OF MORTAR tests for sands (A.A.S.H.O. T71-46) made by testing and inspection agencies did not readily agree with our experience in testing Pacific Coast Aggregates, Inc., sands. To determine the extent of these differences, mortar tests were made using sands from ten producing plants (Table I). Included in the series were three groups of blended sands. Two sands used have been rejected by some agencies because of their reaction when tested for organic impurities. The mortars were made with Brand C, Type I cement. The sands were prepared to conform to the gradings shown in Fig. 1. These gradings (fineness modulus of 2.60, 2.80, 3.00 and 3.20) cover the range of concrete sands specified in this area.

By E. L. HOWARD*

Test methods conformed to A.A.S.-H.O. T71-46 with two exceptions. First, in place of the flow table for measuring consistency, the California State Division of Highways' slump cone method was used. Second, the cylinders were stripped of the paraffin dipped paper molds, cured in water, and capped at the end of the curing period with a sulfur compound in a device especially designed to insure smooth, level caps.

Each of the sands used was prepared by sieving and weighing to conform exactly to predetermined gradings (Fig. 1). In the case of the blended sands the whole of the minus 50-mesh material was the "blending sand." Thus, "104 + Oly" is a combination of coarser than 50-mesh material from Plant 104 and finer than 50-mesh material from the Olympia plant. The blended sands conformed to the gradings adopted for these tests.

*Testing engineer, Pacific Coast Aggregates, Inc., San Francisco, Calif.

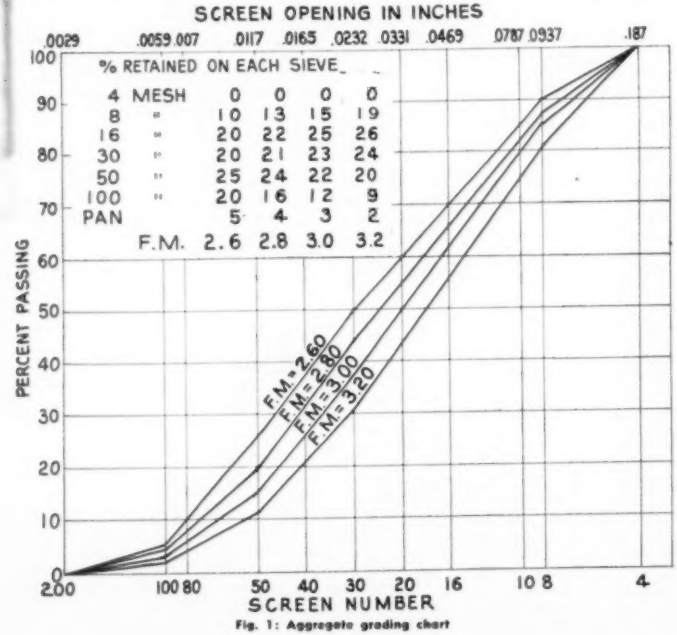


Fig. 1: Aggregate grading chart

Test Results

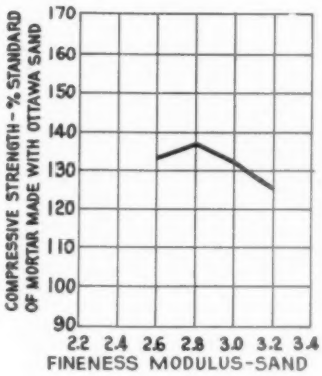
The test results are reported in the tables by gradings; viz., Table II lists the data for all the sands with the 3.2 F.M. The standard shown is the same on all tables and is Ottawa sand mortar as described by A.A.S.H.O. T71-46.

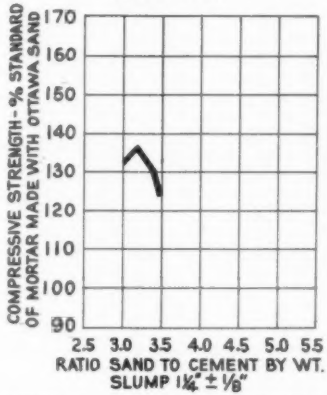
The average of the 28-day compressive strength results has been plotted in Fig. 2 and 4. The average strength of mortars reached an optimum at 2.8 F.M. The average mortar strength made with sand, F.M. greater or less than 2.8, showed a decrease in strength as compared to the optimum. The average strength of mortars reached optimum at the sand-cement ratio of 3.2. Reference to Fig. 3 will show that at the constant consistency used in these tests, the coarser sands required the greater quantity. This quantity is a straight line function of the fineness modulus of the sand.

Some agencies suggest that mortars containing fine sands have greater strengths and this quality may be attributed to the higher paste content of these mortars rather than to a direct relationship between fineness and strength. The data in this test series would suggest that the average sand, F.M. 2.6, requires the greater quantity of paste in mortar of a stated consistency but yields a lesser compressive strength than the optimum, reached in these test averages. The averages indicate that the grading of the sands has the greater influence on the compressive strengths.

Fig. 5 and 6 are typical of the data assembled on each sand and various groupings from the ten plants. Table I identifies these groupings.

The Eliot sand mortars most nearly followed the pattern reported by other agencies. But mortars of Fair Oaks sands showed a constant 28-day compressive strength for all gradings tested (Tables II, III, IV and V). The Kerlinger sand mortars reached 155 percent of standard (28 days) at an F.M. of 3.2. This is 35 percent above Eliot sands of the same grading.





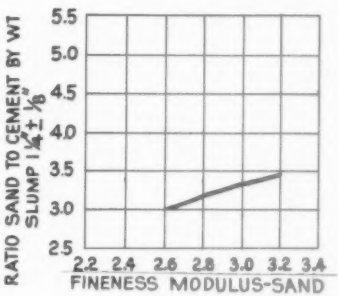


Fig. 2, left: Effect of fineness of sand on mortar strength. Fig. 3, center: Relationship between quantity of sand and strength of plastic mortar. Fig. 4, right: Relationship between fineness and quantity of sand in plastic mortar of constant slump. Points shown are averages of all sands tested

Table I. Identification of sands

Sand		Source
104	Eliot	Ancient alluvial fan—Open pit harvest
106	Centerville	Ancient alluvial fan—Open pit harvest
114	Kerlinger	Ancient alluvial fan—Open pit harvest
111	Fair Oaks	River washed material—River bed harvest
123	Lindsay	River washed material—River bed harvest
124	Rockfield	River washed material—River bed harvest
109	Pratteo	Ocean beach sand
125	Olympia	Quarry sand, coast range
129	Tennant	River washed material—River bed harvest
Rod mill	Eliot	Marcy mill grinding Eliot pea gravel
Bank	S. F.	Wind blown dune sand
Plummer	Fair Oaks	Silt sand adjacent to American river

Table II. Mortar test data—3.2 series

Plant	Color	F.M.	W/C	Slump	Proportion	7-day p.s.i.	Percent std.	28-day p.s.i.	Percent std.
104	1	3.20	.60	1 1/8	1-3.42	2590	151.5	3360	124
106	1	3.20	.60	1 1/8	1-3.59	2105	123.0	3240	120
109	1	3.20	.60	1 1/4	1-4.23	2375	139.0	3280	121
111	1	3.20	.60	1 1/8	1-3.27	2385	139.5	3700	137
114	1	3.20	.60	1 1/8	1-3.20	2560	149.5	4190	155
123	1	3.20	.60	1 1/8	1-3.24	2400	140.5	3550	131
124	1	3.20	.60	1 1/8	1-3.27	2110	123.5	2830	105
125	1 +	3.20	.60	1 1/8	1-3.55	2310	135.0	2790	103
129	1	3.20	.60	1 1/8	1-3.47	2015	118.0	3415	126
Ottawa	1	2.34	.60	1 1/8	1-5.52	1710	100.0	——	——

Table III. Mortar test data—3.0 series

Plant	Color	F.M.	W/C	Slump	Proportion	7-day p.s.i.	Percent std.	28-day p.s.i.	Percent std.
104	1	3.00	.60	1 1/8	1-3.34	2470	145	3390	125
Rod mill	1	3.00	.60	1 1/4	1-3.15	2570	150	3995	148
106	1	3.00	.60	1 1/4	1-3.54	2155	126	3435	127
109	1	3.00	.60	1 1/4	1-3.70	2720	159	3549	138
111	1	3.00	.60	1 1/8	1-3.20	2330	137	3630	134
114	1	3.00	.60	1 1/4	1-3.28	2220	130	4140	154
123	1	3.00	.60	1 1/8	1-3.10	2535	149	3570	132
124	1	3.00	.60	1 1/4	1-3.03	2150	126	3410	126
125	1 +	3.00	.60	1 1/4	1-3.44	2305	135	3340	124
129	1	3.00	.60	1 1/8	1-3.39	1880	110	2820	104
Ottawa	1	3.00	.60	1 1/8	1-5.50	1175	——	2640	——
Ottawa	1	2.34	.60	1 1/8	1-5.52	1710	100	——	——

Table IV. Mortar test data—2.8 series

Plant	Color	F.M.	W/C	Slump	Proportion	7-day p.s.i.	Percent std.	28-day p.s.i.	Percent std.
104	1	2.80	.60	1 1/8	1-3.25	2445	143	3640	134
104 +B.S.	1	2.80	.60	1 1/8	1-3.62	2525	148	3840	142
104 +Oly.	1 +	2.80	.60	1 1/4	1-3.28	2840	166	4315	160
Rod mill	1	2.80	.60	1 1/4	1-2.93	2880	169	4135	153
106	1	2.80	.60	1 1/8	1-3.39	2455	144	3965	147
109	1	2.80	.60	1 1/8	1-4.00	2345	137	3530	131
111	1	2.80	.60	1 1/8	1-3.00	2345	137	3675	136
111 +Plm.	3	2.80	.60	1 1/8	1-2.83	2440	143	3785	140
114	1	2.80	.60	1 3/8	1-3.19	2290	134	4260	158
123	1	2.80	.60	1 1/8	1-3.02	2505	147	4140	153
124	1	2.80	.60	1 1/8	1-2.57	2445	143	3395	124
125	1 +	2.80	.60	1 1/8	1-3.17	2385	140	3445	127
129	1	2.80	.60	1 1/8	1-3.18	1905	112	3340	123
Ottawa	1	2.34	.60	1 1/8	1-5.52	1710	100	2705	100

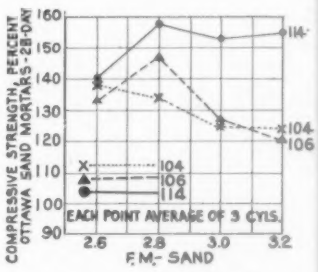


Fig. 5: Effect of fineness of sand on mortar strength. Plants—Eliot, Centerville and Kerlinger. Similar diagrams were worked out for various groupings of each of the sands from the ten plants

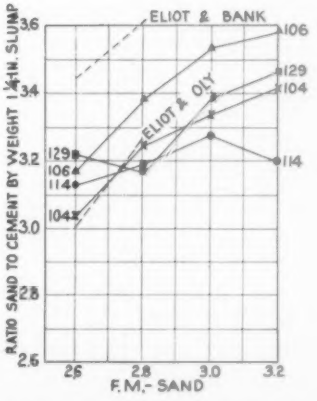


Fig. 6: Relationship between fineness and quantity of sand in mortar—1¼-in. slump

Table V. Mortar test data—2.6 series

Plant	Color	F.M.	W/C	Slump	Proportion	7-day p.s.i.	Percent std.	28-day p.s.i.	Percent std.
104	1	2.60	.60	1¼	1-3.03	2380	139	3765	139
104+B.S.	1	2.60	.60	1¾	1-3.45	2405	141	3915	145
104+Oly.	1+	2.60	.60	1⅝	1-3.00	2615	153	4240	157
104+Rod mill		2.60	.60	1⅛	1-2.79	2795	164	4120	152
106	1	2.60	.60	1⅛	1-3.17	2300	135	3590	133
109	1	2.60	.60	1¼	1-3.62	2420	142	3725	138
111	1	2.60	.60	1⅛	1-3.13	2150	126	3610	133
111+Plm.	3	2.60	.60	1⅛	1-2.58	2660	156	4270	158
114	1	2.60	.60	1¼	1-3.13	2280	134	3780	140
123	1	2.60	.60	1¼	1-2.85	2560	150	3970	147
124	1	2.60	.60	1⅛	1-2.68	2145	126	3030	112
125	1+	2.60	.60	1⅛	1-3.02	2675	156	3805	141
129	1	2.60	.60	1⅛	1-3.22	1780	105	2980	110
Ottawa	1	1.65	.60	1⅛	1-2.83	1540	91	2450	——
Ottawa	1	2.34	.60	1⅛	1-5.52	1710	100	——	——

These two sands are equal at 2.6 F.M.

The blended sands yielded better compressive strengths than the individual sands at all gradings. Plummer and Olympia sands have been rejected by some agencies because of the results in the organic test.

In general, the coarser sands required greater quantities at a common consistency (See Fig. 6). But no two sands were alike in this requirement. The river sands required less material at the given consistency than the open pit sands. This greater amount of cement paste, in the case of river sands, does not assure a higher compressive strength.

Conclusions

The data from these studies evidence the fallibility of A.A.S.H.O. T71-46 (identical to A.S.T.M. method C87) in measuring the effect of organic impurities on the strength of mortar.

The data suggest that grading plays a prominent part in strength yield.

Comparison of the 7- and 28-day compressive strengths indicates that sand mortar strengths are affected by the structure of the sand particles on the several sieve sizes. Thus, mortar made using an Olympia sand, F.M. 3.2, having a high percentage of particles on the coarser sieves has a good strength at 7 days but a comparatively poor strength at 28 days, apparently having reached the maximum possible at an early age. (Note: The coarser sizes of Olympia sand are visibly poor in structural strength.)

Only one brand of cement was used in these tests. However, comparison of this data with routine tests made in the past convinces the writer that the several brands of cements will yield strengths peculiar to the individual cement.

Sand and Gravel Safety Competition

THE MEMPHIS, TENN., PLANT of Marquette Cement Manufacturing Co., the Irwindale, Calif., Plant No. 6 of Consolidated Rock Products Co., and the Kingsbury, Texas, plant of Fort Worth Sand and Gravel Co., Inc., won highest safety honors in their respective groups of the 1950 National Sand and Gravel Safety Competition, conducted by the Bureau of Mines. The trophies awarded to the winning plants are to be awarded by ROCK PRODUCTS. The National Sand and Gravel Association awarded Certificates of Achievement in Safety to the participating plants which worked 20,000 or more man-hours through 1950, without a disabling injury.

The Memphis plant was the winner of the group working more than 100,000 man-hours and achieved the record of 131,699 man-hours without any disabling injuries. The plant has been enrolled in 12 of the 22 years of this competition and has been a trophy winner five times, the other years being 1937, 1940, 1945 and 1947. It was also awarded certificates in 1938 and 1944 for injury-free years.

The Irwindale plant was the winner of the group working 50,000-100,000 man-hours. It operated 99,616 man-hours with no disabling injuries. Top safety honors in the group working 50,000 or less man-hours were awarded to the Kingsbury plant for working 49,085 man-hours with no lost-time injuries.

The aggregate safety record of all participating plants in 1950 was reported to be one of the best annual records in the history of the competition. The frequency rate of 25.445 injuries per million man-hours worked was better than in any other year, except 1944 and 1934, since the contest was started in 1929. The severity rate of 2.629 days of disability per thousand man-hours of exposure was the fifth best annual rate. During a total worktime of nearly 7,000,000 man-hours at the plants, there were 177 disabling injuries, of which one was a fatal injury, five were permanent total disabilities, and 171 were temporary total disabilities.

A record number of 112 sand and gravel plants were enrolled in the 1950 competition, of which 55 had perfect safety records. The following plants (excluding the trophy winners) were awarded the N.S.G.A. Certificates of Achievement. (In addition there were 18 injury-free plants which did not receive certificates because they did not fulfill the minimum requirement of 20,000 or more man-hours.

Eagle Lake dredge plant, Texas Construction Material Co., Eagle Lake, Texas; 129,880 man-hours

Quigley wet-pit plant, Fort Worth Sand and Gravel Co., Inc., Fort Worth, Texas; 105,819 man-hours

Hudson dry-wet-pit plant, Gifford-Hill and Co., Inc., Hearne, Texas; 77,947 man-hours

Centerville No. 106 dry-pit plant, Pacific Coast Aggregates, Inc., Centerville, Calif.; 70,760 man-hours

Pekin dredge plant, McGrath Sand and Gravel Co., Pekin, Ill.; 64,539 man-hours

Sunland dry-bank plant, City Rock Co., Sunland, Calif.; 63,255 man-hours

Alexandria dry-bank plant, Northern Virginia Construction Co., Inc., Alexandria, Va.; 62,340 man-hours

Snelling Avenue dry-pit plant, J. L. Shiely Co., St. Paul, Minn.; 60,639 man-hours

Laban Spur wet-pit plant, Texas Construction Material Co., Alleyton, Texas; 55,770 man-hours

Plainfield dry-bank plant, The Chicago Gravel Co., Plainfield, Ill., 53,937 man-hours

Largo No. 10 dry-pit plant, Consolidated Rock Products Co., Azusa, Calif.; 51,485 man-hours

Orange No. 14 dry-pit plant, Consolidated Rock Products Co., Orange, Calif.; 46,278 man-hours

Thomas wet-pit plant, Fort Worth Sand and Gravel Co., Inc., Birdville, Texas; 45,537 man-hours

Lincoln dredge plant, The Lincoln Sand and Gravel Co., Lincoln, Ill.; 44,396 man-hours

Hartland dry-pit plant, Hartland Sand and Gravel Corp., Hartland, Wis.; 42,684 man-hours

No. 2 dredge plant, Lyman-Richey Sand and Gravel Corp., LaPlatte, Neb.; 40,782 man-hours

No. 9 and 11 dredge plants, Lyman-Richey Sand and Gravel Corp., Valley, Neb.; 40,587 man-hours

"F" dry-bank plant, The Buffalo Slag Co., Inc., Franklinville, N. Y.; 40,387 man-hours

Fort Jefferson dry-bank plant, American Aggregates Corp., Fort Jefferson, Ohio; 40,349 man-hours

Holley dry-bank plant, Gifford-Hill and Co., Inc., Van Horn, Texas; 38,488 man-hours

Kaw No. 2 dredge plant, Stewart Sand and Material Co., Turner, Kan.; 38,151 man-hours

No. 7N dredge plant, Lyman-Richey Sand and Gravel Corp., Plattsmouth, Neb.; 37,890 man-hours

Sierra No. 19 dry-pit plant, Consolidated Rock Products Co., Monrovia, Calif.; 36,168 man-hours

Portland dry-bank plant, Portland Sand and Gravel Co., Portland, Penn.; 35,511 man-hours

Kalamazoo dry-bank plant, American Aggregates Corp., Kalamazoo, Mich.; 35,217 man-hours

No. 5 and 6 dredge plants, Lyman-Richey Sand and Gravel Corp., Plattsmouth, Neb.; 35,147 man-hours

Lindsay No. 123 wet-pit plant, Pacific Coast Aggregates, Inc., Lindsay, Calif.; 34,964 man-hours

Yardley wet-pit plant, Union Sand and Gravel Co., Spokane, Wash.; 31,201 man-hours

Akron dry-bank plant, Rubber City Sand and Gravel Co., Akron, Ohio, 30,473 man-hours

Bloomington dredge plant, McGrath Sand and Gravel Co., Bloomington, Ill.; 30,320 man-hours

"C" dry-bank plant, Hornell Gravel Corp., Cohocton, N. Y.; 28,254 man-hours

Boonville No. 1 dry-bank plant, Eastern Rock Products, Inc., Boonville, N. Y.; 27,562 man-hours

Carpentersville dry-bank plant, Portland Sand and Gravel Co., Carpentersville, N. J.; 26,858 man-hours

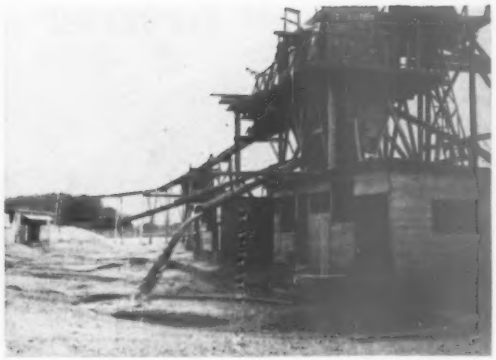
Fort Wright dry-bank plant, Union Sand and Gravel Co., Spokane, Wash.; 23,306 man-hours

National Gypsum Expansion

NATIONAL GYPSUM CO., Buffalo, N. Y., has announced plans for building a $3,775,000 addition to its Medicine Lodge, Kan., plaster-plant facilities, consisting principally of a new wall-board plant. Gypsum ore is obtained from the nearby Gyp Hills where 25,000 tons of rock a month will be mined to feed the production line.



There are five truck loading hoppers, one for each size of aggregate, that are filled by draglines scooping the material from separate sumps outside the screening plant



The various sizes of gravel from the screening plant are spouted to the toe of the storage piles where draglines deliver the material to truck loading bunkers

"Double-Duty" Storage Piles

DOUGLAS COUNTY GRAVEL CO. of Omaha, Neb., has its gravel and sand plant some 20 miles west of Omaha and all the plant's output is trucked to market in a fleet of company-owned trucks.

The plant is a simple but efficient operation and consists principally of two 8-in. diameter suction dredges. One pump is an Amsco unit and the other was made by Fremont Foundry Co., Fremont, Neb. Both pumps deliver to a screening plant using stationary screens. Five sizes of aggregates (including the sand) are produced and these materials are spouted to small individual sumps that parallel the long axis of the screening plant. The excess water from each sump flows to waste.

Serving each of the five sumps is a 1-cu. yd. Sauerman crescent drag scraper. As the material accumulates in the sump it is dragged to a truck loading bin for final disposal. There are five wooden bins, one for each size of aggregate, and all the bins are in a row over a single truckway. Three of the scrapers are powered by electrically-driven two-drum hoists and the other two hoists are gasoline driven.

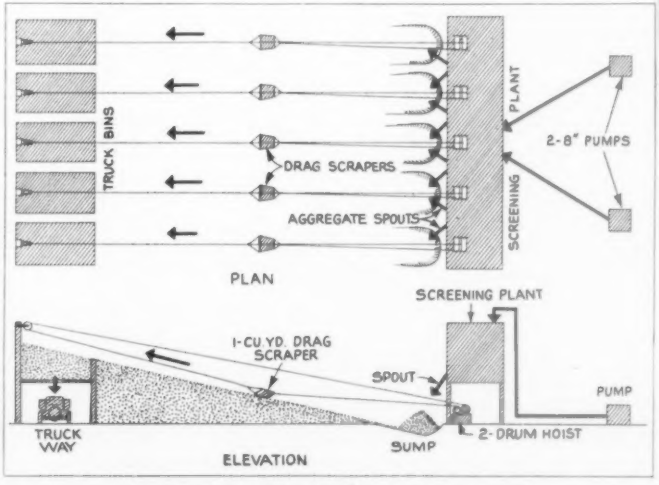


Crescent-shaped drag scrapers are used to transport the material from the sumps in the foreground to the truck loading bins

Ramp Is Storage Pile

It appears to be general practice at this plant to let the material in the sump accumulate until a truck-load is wanted, and at that time to drag the material up the ramp to the top of the bin. The ramp is made up of the size of material being produced at that sump, so essentially the ramp is a storage pile of considerable size.

Gravel in the production area west of Omaha is relatively small in size. Anything larger than 2 in. is seldom found; ¾ in. to ½ in. is more likely. High sand content is the general rule. In the fleet of trucks hauling the material into the Omaha area is a 14-cu. yd. bottom-dump body made by Standard (Council Bluffs) and powered by a White tractor. All materials are weighed at the plant on a set of Howe truck scales. Sam Leard is plant foreman and R. A. Heimbaugh is superintendent.



Plan and elevation of Douglas County Gravel Co. operation



Conveyor belt No. 1 is 500 feet long and is part of the assembly that conveys gravel from the separator to the surge bin in the center. The smokestack in the background is part of the Penn-Dixie Cement Corp. Des Moines, Iowa, plant

Concrete Materials Co., Des Moines, Iowa, uses centrifugal debris separator and re-designs for belt conveyor transportation

REMOVING DEBRIS FROM SAND AND GRAVEL

CONCRETE MATERIALS Co., Waterloo, Iowa, is the largest aggregate producer in the state of Iowa and one of the most productive in the Middle West. Its Des Moines, Iowa, sand and gravel plant is one of the larger units. Quite recently the general plan of intraplant transportation was changed from industrial haulage to a belt conveyor system so that all aggregates pumped from land adjoining the Raccoon river are first sent to a semi-portable plant mounted on the bank near the dredge. Trash (some coal, shale and river debris) is removed at the semi-portable plant by a Halloway separator and the debris discarded. The sand (minus 7/64 in.) is also separated from the gravel and is pumped by a 12-in. Amsco pump to a reclaiming pond. In this pond is a 10-in. Amsco dredge which recovers the sand as needed. The first dredge is a 16-in. Amsco unit. It pumps through a 16-in. steel pipe line to the separator. The three-pump system gives the plant greater flexibility.

Debris Separation

The Halloway separator was described by W. W. Roberts, general superintendent of Concrete Materials Co., at the 1951 annual meeting of the National Sand and Gravel Association held in New Orleans, La. Since the general subject of aggregate specifications is becoming more important each year, the general characteristics of the separator are worthy of additional mention. The separator was made by the company.

The separator works somewhat on the same principle as a cyclone dust collector, except in the latter case air is the carrying agent, and here water is the conveying medium. It receives the pulp from the 16-in. dredge pump. It does not operate under any static pressure, only the dynamic pressures due to the normal flow of pulp from the pump.

The backbone of the separator is a used 16-in. Amsco pump shell that has been relined with a hard-surfacing alloy applied by conventional welding techniques. Those sections within the shell that receive most of the impact of the incoming pulp are built up and thicker than most of the shell's interior.

The old shell is mounted in a horizontal position, and the pulp from the 16-in. dredge pump enters through the neck that previously was the pump's discharge opening. When mounted in this manner and the pulp pumped into the shell, centrifugal motion is imparted almost exactly similar to the dust in a conventional dust collector. Due to the centrifugal movement of the pulp, the sand and lighter debris rise in the outer edge of the upper vortex and are discharged over a trash grizzly. Coal, shale, slabby rock and any rubbish that previously contaminated the river is removed by this simple device. The sand and water goes through the trash screen and is picked up by the 12-in. suction line and pumped to the sand reclaiming pond.

The bottom of the Halloway separator is a cone-shaped unit that is bolted to the shell assembly. The angle of the



The deposit being worked by Concrete Materials Co. contains some coal, shale and clay. The dredge pump delivers material to the debris separator mounted on the bank near the dredge where the trash, etc. is removed



The 15-in. pipe line goes to the debris separator. Gravel goes to a surge bin via the conveyor at the extreme left; debris goes out the spout at right. Sand is pumped to a pond and when wanted, it is reclaimed by a dredge pump



A 16-in. dredge pump shell is the major part of the separator. The cylindrical section is open at the top for visual observation. Pulp enters through the pipe at the right rear

sides of this cone is about 45 deg. and can best be arrived at by the old rule of "cut and try." In the bottom vortex formed by this cone are the heavier pieces of gravel along with a small amount of sand. This material discharges through the open end of the cone to a dewatering screen. The fines go to the 12-in. pump and the gravel (and some sand) go to the new belt conveyor system.

Belt Conveyors

The new transportation system consists of three belt conveyors that are 500 ft., 130 ft. and 200 ft. long. The first two are 24 in. wide and the last 30 in. wide. The latter is the reclaiming belt from the new 500-ton capacity Armco steel tank used as a surge bin between the separator plant and the main screening and washing plant.

A belt feeder is located under the surge bins, which have gravity-type gates. The plant uses a 10- x 36-in. Cedarapids jaw crusher and Eagle Iron Works log washers for removal of any clay or coal remaining in the product. All material from ⅜ in. to 1½ in., whether crushed or uncrushed gravel, goes through the log washers. Binned aggregates can be reblended on a 36-in. blending belt prior to shipment. The new belt conveyor installation uses Goodyear belts and Link-Belt idlers. Splices are Flexo.

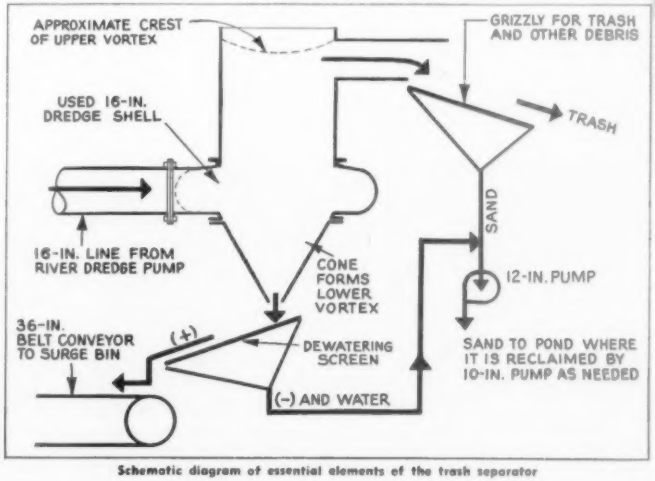
The general offices of Concrete Materials Co. are in Waterloo, Iowa. T. E. Rust is vice-president; Gene Mason, sales manager; W. W. Roberts, vice-president and general superintendent; and F. E. Bellamy, president. Howard Barnett is superintendent of the Des Moines operation.

Phosphate Plant

PHOSPHATE FERTILIZER, INC., has started construction of a 100-ton per day phosphate processing plant at Phosphate, Wyo., near Kemmerer. The plant, said to be the only one of its type in the United States, is being patterned after a processing plant in Germany. Construction is expected to take about three months and will consist of installing rotary kilns, bins for storage of raw materials, conveyors, and bins for storage of the finished product.



The 500-ton surge bin receives the gravel (and some sand) from the separator. The reclaiming conveyor can be seen at the left



Schematic diagram of essential elements of the trash separator

SILICA PRODUCERS TALK SHOP

N.I.S.A. considers freight rates, percentage depletion, industrial health, and federal controls at fall meeting

MORE THAN ONE HUNDRED members and wives were present at the successful semi-annual meeting of the National Industrial Sand Association held October 17-19 at The Greenbrier, White Sulphur Springs, W. Va. Meetings were scheduled for the three mornings and the afternoons were left open for golf tournaments and other recreation.

According to custom, the discussions were informal and of a round-table nature and there were no prepared papers. Subjects included traffic matters, engineering problems, car supply, price and wage controls, priority and allocation controls and industrial health legislation.

President Sterling N. Farmer was presiding officer for the first session which began with presentation of the financial report and adoption of a budget for 1952.

Freight Rates

Emery M. Durstine, chairman of the traffic committee, followed with his report and then William W. Collin, Jr., association counsel, commented on current traffic matters. Mr. Collin spoke briefly on the bonded sand case, the box car case and the freight rate increase under Ex Parte 175. The bonded sand case resulted in a reduction of 50 cents per ton from the existing freight rate, and the freezing of the differential rate as it had existed between bonded sand and other sands.

The box car case has an important bearing on consumers, and manufacturers of flat glass and containers joined the producers of sand in presenting a case before the I.C.C. for adjustment. The case was tried in March, the brief was completed in July and the report of the examiner is due. Considerable confusion has existed as to rates that apply, and Mr. Collin cited cases where, because the tariff for sand as published was less than the carriers intended, the carriers had sued receivers for the difference and recovered. Shippers, on the other hand, have sued the carriers for refunds.

The Ex Parte 175 freight raise increase gives the carriers a 9 percent increase in the east and 6 percent for the rest of the nation and is the latest of a chain of increases in rates granted the railroads. This increase is of special interest, said Mr. Collin, because the I.C.C. members were in disagreement in the details of the increase and the increase was limited to 18 months. This would indicate that there is growing reluctance to grant increases and recognition that there is need for stability so as not to upset commerce by setting up differentials that seriously affect competition.

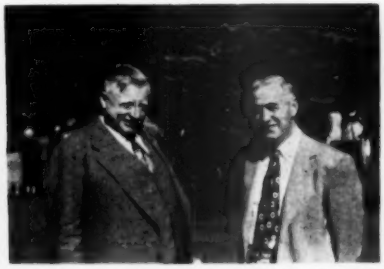
Displacement of competitive relationships was emphasized in the case before the I.C.C. opposing this new freight rate increase. Mr. Collin mentioned how freight rate increases and the abolition of the old differentials put Pittsburgh steel producers out of business in the East. In another instance cited, an individual started a prepared roofing material business in 1935 and built it into the largest in the United States by spotting plants in strategic locations to meet competition to best advantage. His plan includes truck delivery and delivered price quotations.

The accumulated effect of freight rate increases has amounted to a 67 percent revenue increase since 1946. In Mr. Collin's opinion, the only answer to stopping the piling on of rate increases is political, since people expect the trend to continue on and on as long as the present administration is in power. It is apparent that the railroads are losing traffic to trucks, which Mr. Ahearn substantiated by citing that 42 industrial sand producers moved approximately 277,000 tons of product by truck during the third quarter of 1951. A few years ago, truck shipments were negligible. Business once lost by the railroads to trucking is not recaptured.

Discussion brought out that members of the I.C.C. are not experts but men who feel a responsibility for the solvency of the railroads; and that the danger lies in the fact that increases in freight rates continue to be added in small increments that result in a considerable total. As a result, there is a tendency not to resist the increases whereas affected industries should go on record as to their attitude if for no other reason than an obligation to keep the I.C.C. informed.

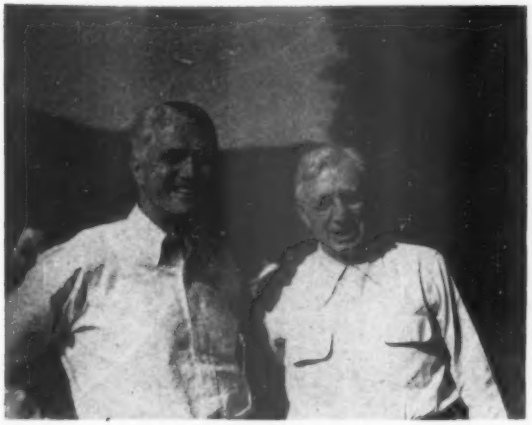
A round-table discussion on engineering problems was led by Stanton







Left: John F. Putnam, The National Silica Co., Oregon, Ill., left, watches the golfers tee off with E. O. Schneider, Ottawa Silica Co., Ottawa, Ill. Center: John Reading, Construction Aggregates Corp., Chicago, Ill., left, was caught talking shop with P. W. Palmer, Browntown Silica Co., Browntown, Wis. Right: Arthur B. Schlesinger, New Jersey Pulverizing Co., New York City, left, exchanges pleasantries with A. Warsaw, Wedron Silica Co., Chicago, Ill.





Left: Past president George A. Thornton, left, poses with A. N. Farmer. Right: Two "old pros" ready for the tee off; E. M. Durstine is on the left, with Claude P. Helmick

Walker. Mr. Walker is active on special committees of the A.F.A., but reported that there had been little committee activity affecting the industry during the past several years. He commented that there is a tendency to increased use of plastic molds, competitive with sand, in some of the major industries with foundries which bear watching.

The industry continues its interest in improving the packing of silica flour, and the subject came up again for much discussion. Producers are seeking an improved packing machine or improvements to incorporate in existing machines that will prolong the life of wearing parts and eliminate much of the dust associated with packing silica flour. Several producers reported their experiences with various packing machines and with special parts supplied for the more conventional machines but experience has been limited and the problem demands further study.

P. W. Palmer of Browntown Silica Co. is perfecting a packing machine which he believes will solve the problem when an attachment is installed to overcome faulty feeding to the machine. This machine has four tubes and will fill a bag in six seconds, or a 50-ton car in 75-90 minutes.

Percentage Depletion

Emery M. Durstine presided over the second session substituting for vice-president C. M. Hardy. John T. Sapienza, counsel, discussed percentage depletion and other provisions of the Revenue Act of 1951.

Of the three kinds of depletion, cost, discovery and percentage, Mr. Sapienza said that percentage depletion which was granted the industry in the new tax law is preferable since it is related to gross income and not cost. The way the 5 percent allowance works, if a company receives a $1,000,000 gross income from mining, for example, a $50,000 deduction is permissible but the permissible deduction cannot exceed one-half the net income.

If a producer owns or leases a deposit he is entitled to percentage depletion but if he is a licensee he may or may not receive the benefit. An independent contractor for excavating is not eligible for percentage depletion.

In answer to a question as to the application of percentage depletion when property is leased on a royalty basis, it was brought out that both the lessor and lessee are entitled to percentage depletion. The lessor would compute the percentage on the basis of the rental royalty as gross income and the lessee on the value of the material less rentals or royalties paid.

There was considerable discussion as to the meaning of "gross income from mining" which is the figure stated on which the permissible percentage is taken. Questions were brought up as to whether the figure would be based on the first commercial stage of production or be applied to the dried product or ground product in computing the income from mining and, if the value of the end product be taken, what about transportation where the mill is distant from the deposit, etc. Also, the question came up as to whether the dollar sales volume would apply which would include the selling steps, and whether bagging steps might be included, etc.

Inasmuch as sintering operations, and other processing steps are permissible in the case of coal in determining a value figure, it was suggested that the industrial sand industry might deduct 5 percent from gross sales volume and then, if necessary, argue its case with the Internal Revenue department and thus arrive at clarification of this issue.

Mr. Sapienza then discussed the effects of the tax increases levied under the Revenue Act of 1951 which apply to companies from April 1, 1951, and have a termination date of March 31, 1954, and he also touched upon individual income tax increases, the provisions governing the sales of private homes which exclude a capital gains tax if a more expensive home be purchased and other provisions. By now, the industry no doubt is familiar with the scale of increased taxes. He concluded by saying that chances are good that there will be no changes to the Renegotiation Act as it affects the industrial sand industry.

Industrial Health

Theodore C. Waters, association counsel, presented his usual informative report on the trends in workmen's compensation and legislative developments affecting industrial health which are of current interest to the industry. His report covered (1) legislative developments in workmen's compensation during 1951; (2) exclusiveness of remedy of workmen's compensation statutes; (3) workmen's compensation insurance rates; and (4) potential products liability in the sale of material by producers.

The report on legislative developments brought up-to-date his earlier report at the May, 1951, meeting which was given at a time when many of the state legislatures were still in session. As of December 31, 1950, 41 states had enacted occupational disease compensation statutes. This year, the states of Alabama and Vermont have enacted such statutes.

The Alabama statute became effective June 29, 1951, and makes "occupational pneumoconiosis" compensable. It is elective as to both employer and employe and grants either party





Left: With the usual nickel-a-hole at stake, Stanton Walker, left, and Theodore Waters start their golf with an argument on the first tee. Right: A. N. Farmer, Sand Products Corp., Cleveland, Ohio, center, came to his first meeting in several years. On the left is President Sterling Farmer and, on the right, John G. Putnam of Oregon, Ill.

the right to terminate his acceptance or rejection upon 30 days' written notice to the other side. There is a limitation of monetary liability of $4750 for disability or death with monthly compensation at the rate of $200 until the full benefits of the law are attained.

An occupational disease law enacted by Vermont, effective July 9, 1951, contains a schedule of compensable diseases including silicosis and asbestosis and is considered an excellent statute by Mr. Waters. A unique feature is that compensation is denied for partial disability from any of the occupational diseases. Included is a definition of the term "disablement" meaning "that an employe is totally disabled to perform any further work in his then occupation or in any other trade, business or occupation." Monetary liability for disability or death from silicosis begins at $400 per month during the first month the act becomes effective and increases at the rate of $25 per month until a limit of $4000 has been reached.

Several bills for occupational disease legislation were introduced in Oklahoma but none were enacted, with the result that employers continue to be subject to the hazard of common law litigation for this type of injury. However, Oklahoma did enact a statute providing compensation in death cases in the amount of $13,500, which will relieve employers from the continuing hazard of excessive verdicts in death cases and also assure dependents of the compensation provided.

With respect to legislative changes in occupational disease compensation laws, Mr. Waters again discussed the action in New Jersey resulting in the repeal of this special statute making silicosis and asbestosis compensable. This amendment, which became effective July 1, 1951, means that there is no longer a distinction between benefits arising from disability or death in traumatic injuries from those of occupational diseases.

The state of Maryland amended its law, changing from the scheduled type to general coverage. A new and novel feature of the law is the treatment of compensation for demonstrable evidence of pulmonary dust disease where capacity for work is impaired short of total disability. Then the commission may grant an award of $1000 with the right to the claimant to reopen the case within five years if the disability has become permanent and total disability or death has ensued.

An amendment to the California compensation statute, which could be of serious concern to industry, provides that an injured employe may assert his claim for occupational disease compensation against any employer for whom he previously worked irrespective of the date of termination of employment. If trial be held against such an employer, other of the individual's former employers may be required to contribute. This amounts to complete abrogation of the statute of limitations.

An amendment to the New York Workmen's Compensation Act dealing with permanent total disability or death from silicosis which might result in retroactive benefits for injuries was pointed to as one that bears watching. The statute had an escalator clause of monetary benefits for permanent total disability or death and now, through a 1951 amendment, permits the reopening of the original cases and increases the benefits payable to those comparable to the full benefits of the law for other occupational diseases and death. The employer is relieved of liability and the costs are chargeable to the special disability fund; the law is retroactive in its effect.

Mr. Waters' comments on "exclusiveness of remedy of workmen's compensation statutes" were built around a recent court decision which raised questions and problems as to the potential liability of employers to the spouse of an employe who has been injured and whose claim is compensable under the workmen's compensation statute. In the case in question, the wife of an injured employe brought common law suit against the employer for loss of consortium (defined as the sum of those expectations growing out of the marital relationship to which each spouse is entitled, such as companionship, society, assistance, comfort and affection) with her husband because of injuries for which he received full compensation.

The court sustained the right of the wife to maintain such action and the precedent of this case may possibly lead to similar decisions by other courts. This case was used by Mr. Waters to point out potential liability in a field where the employer may have felt secure. This liability may be protected against by workmen's compensation insurance and public liability insurance which protection was strongly advocated.

In his comments on trends in rates applicable to workmen's compensation, Mr. Waters said that whereas the general trend in insurance rates has been downward over a ten-year period the picture has changed because of increased benefits under the compensations laws and unfavorable experience in a number of heavy industries. Higher rates are anticipated for the coming year.

National experience as to occupational diseases has continued favorable, including silicosis, with the result that decreasing rates are expected

provided no significant outbreaks occur in the industry. The carriers are deemphasizing occupational diseases.

As to the subject of products liability insurance to cover the hazard for personal injury or property damage resulting from defective products, he said that comprehensive general liability policies are available to the industry. Rates for such policies, which he questions as to their value, are high because of lack of experience information.

Discussion brought out that the unfavorable trend in insurance rates is due principally to inflation and that the answer is to do everything possible to reduce accidents.

Federal Controls

Clarence R. Wolf, treasurer, presided over the closing session which largely considered federal controls for industry. Price and wage controls were discussed by executive secretary V. P. Ahearn. He said that the industry was fortunate in having Walter Acheson head up pricing controls and because the industry is not required to absorb transportation costs. Thus far, the industrial sand industry does not have an advisory committee and comes under the general price regulations, thus it has no basis to apply for price relief. Ultimately a regulation will be required to enable the industry to make application for price relief when necessary. It is Mr. Ahearn's opinion that we will have price controls for a long time, even should the Republicans be elected in 1952.

As to wage and salary stabilization controls, detailed reports were to be sent the industry in the early future. With respect to wages it was brought out that it would be unsafe to raise wages automatically according to a cost of living index such as the General Motors Co. plan. Christmas bonuses can continue to be paid to conform with practices in effect before the control law was imposed but there is no provision for new bonuses. Bonuses paid according to contract can be continued although the Wage Stabilization Board restricts such bonuses to a 25 percent increase.

George H. Roll, Requirements Division, Defense Minerals Administration, in commenting briefly on priority and allocation controls, said that D.M.A. is trying to help industry and that effective assistance in obtaining equipment can be obtained if an industry will provide the necessary information tying itself to the defense program. It is necessary that D.M.A. have a breakdown percentage-wise of the various end uses of an industry's products. A revision of the M-78 order, MRO, was promised to clarify its provisions.

A number of specific questions were asked of Mr. Roll. With respect to inadequate quotas, he said it would be necessary to file form 400 in seeking quantity quota adjustments. To secure rating assistance for major capital equipment he said that Section 15 of the M-78 order outlines procedure. An order number is necessary for dollar amounts in excess of $2000. D.M.A. must go to a designated division of N.P.A. to obtain an actual rating and N.P.A. must know first that a concern cannot get delivery on equipment before any action will be attempted.

Where special handling is requested with respect to securing an equipment part that is unavailable, the D.M.A. will try to assist but must be posted on methods previously tried which were unsuccessful. In answer to a question, it was advised that requests for repair parts needed next spring should be placed now. The general gist of Mr. Roll's talk was that D.M.A. could function most effectively in its efforts to aid industry, if it be advised of all pertinent facts available pertaining to the company's markets, efforts to purchase the equipment, etc.

Upon completion of the discussion of controls, the ladies were invited into the meeting to hear plans for the 1952 fall meeting to be held in Bermuda, October 15-17, and a review of the Washington scene by V. P. Ahearn.

Washington Scene

Mr. Ahearn's talk was an off-the-cuff appraisal of his observations and, like the talk he presented a year ago, was received with a great deal of enthusiasm although he pictures a rough road ahead. He led off with the MacArthur incident which had its important effects. For one thing, it established that a civilian definitely is the commander-in-chief of the armed forces. It further established that the United States will never surrender Formosa, nor will it ever permit Red China membership in the United Nations. Since the MacArthur incident we are now committed to victory in Korea and we are bound by treaty to defend Australia, New Zealand, Japan, the Philippines and Formosa.

As to personalities high in office, Mr. Acheson is the second most important figure in Washington and Mr. Truman will continue to support him. Mr. Acheson was described as enigmatic and courageous but a poor administrator. He will be a prime Republican target in 1952 because of some of the mistakes he has made and which have been widely publicized.

General Marshall was described as a good soldier but poor administrator. He is respected but is cold and there is no affection for him. The opinion was expressed that administration officials were relieved that General Marshall retired. Secretary of Defense Lovett is considered a good appointment.

As to the future, Mr. Ahearn said that we are committed to a full dress defense program and we have an international policy to which we have committed our wealth and life. The program will have bipartisan support, being one committing us to permanent alliances with other nations. Some $100 billion is scheduled to be spent for defense over the next two years

(Continued on page 138)







Left: Marcus S. Wright, Jr., South River Sand Co., Old Bridge, N. J., required two drivers to hit the ball. Center: Treasurer Clarence R. Wolf with his ever-present movie camera, left, with President Sterling Farmer. Right: Gene Mason, Clayton Silica Co., Waterloo, Iowa, displays his alleged "form" before entering the tournament play

STANDARDIZATION OF POTASSIUM DICHROMATE SOLUTIONS

By OSCAR D. GUIRE

MANY ANALYSTS find high grade iron wire to be convenient for standardizing a solution of $K_2Cr_2O_7$. Others prefer a sample of some sort which has been analyzed and certified by the National Bureau of Standards. For the determination of Fe_2O_3 in portland cement the American Society for Testing Materials specifies as the primary standard the standard Sibley iron ore issued by the N.B.S. as its standard sample No. 27. Iron ore is inconvenient to use. The bureau does not issue an iron with a certified value of Fe.

When barium diphenylamine sulfonate is used as an interval indicator, it consumes from 0.05 to 0.20 ml. of $K_2Cr_2O_7$ under the conditions specified by A.S.T.M. The exact amount can not be determined directly. Therefore it is specified that the weight of standard iron ore used in standardization be one that will yield a titration within 3 ml. of that required by the cement sample in question.

The author has found that by using standard $K_2Cr_2O_7$ issued by the N.B.S. as its standard sample No. 136, one can meet all requirements of convenience, accuracy, and economy and determine a blank correction and a value for the solution of $K_2Cr_2O_7$ which are applicable to all iron-bearing samples.

Procedure

Prepare:

Solution s. Dissolve from 0.1220 to 0.1230 g. of N.B.S. standard $K_2Cr_2O_7$ in water and dilute to 50 ml.

Solution f. Dissolve from 7.59 to 7.61 g. of $FeSO_4$ in water and dilute to 1 liter.

Solution k. Dissolve analytical reagent $K_2Cr_2O_7$ in water on the basis of from 2.450 to 2.460 g. per liter of solution.

Standardize solution *f* against solution *s* (the first titration). Immediately, with approximately the same volume of solution *f*, standardize solution *k* (the second titration). Repeat this double titration with different amounts of solution (the third and fourth titrations); 24 and 12 ml. are suggested.

$$F = \frac{wS}{50} \times 1.628 \times \frac{s_1 - s_3}{f_1 - f_3}$$

$$K = F \times \frac{f_2 - f_4}{k_2 - k_4} = \frac{wS1.628\ (s_1 - s_3)\ (f_2 - f_4)}{50\,(f_1 - f_3)\ (k_2 - k_4)}$$

$$B_2 = k_2 - \frac{f_2 F}{K} = k_2 - \frac{f_2\,(k_2 - k_4)}{f_2 - f_4}, \text{ and}$$

$$B_4 = k_4 - \frac{f_4 F}{K} = k_4 - \frac{f_4\,(k_2 - k_4)}{f_2 - f_4}$$

(In like manner, B_1 and B_3 may be calculated from the first and third titrations. Theoretically $B_1 = B_2 = B_3 = B_4$.)

Where:

F = the value of solution *f* in terms of g. of Fe_2O_3 per ml.,

w = the weight of standard $K_2Cr_2O_7$ in solution *s*,

S = the oxidizing factor of the standard $K_2Cr_2O_7$ (for example, if the standard is certified to be equivalent to 100.06 percent $K_2Cr_2O_7$ as compared with another standard, S = 1.0006),

50 = the total volume of solution *s* in ml.,

1.628 = the ratio of the molecular weight of $3Fe_2O_3$ to that of $K_2Cr_2O_7$,

s_1 = ml. of solution *s* in the first titration,

s_3 = ml. of solution *s* in the third titration,

f_1 = ml. of solution *f* in the first titration,

f_3 = ml. of solution *f* in the third titration,

K = the value of solution *k* in terms of g. of Fe_2O_3 per ml.,

f_2 = ml. of solution *f* in the second titration,

f_4 = ml. of solution *f* in the fourth titration,

k_2 = ml. of solution *k* in the second titration,

k_4 = ml. of solution *k* in the fourth titration,

B_2 = blank correction from the second titration, and

B_4 = blank correction from the fourth titration.

Notes

1. Each titrating solution should contain the same amounts of HCl, $HgCl_2$, H_3PO_4 and indicator as used in analysis. Only one drop of $SnCl_2$ solution can be added. The final volume (about 100 ml.) can vary as much as 25 ml.

2. The end-point should always be the appearance of the deep purple color, never its disappearance. The color fades if the oxidized solution is allowed to stand 1 hr. or longer. If the end-point is passed, the fading is unusually slow.

3. The procedure as given above is the minimum. If one wishes to avoid the possibility of error in weighing or buret reading, he may prepare two solutions of N.B.S. $K_2Cr_2O_7$ and use each three times (24, 16 and 8 ml. instead of 24 and 12). If the several values of K and B vary slightly, their average may be assumed to be correct.

4. All the titrations should be made within 4 hr. and before solution *f* deteriorates appreciably.

Reference

American Society for Testing Materials, Standards on Cement, January, 1948.

Heat of Hydration Study

APPEARING IN A RECENT ISSUE of *Highway Research Abstracts* was an item on "A Study of the Determination of the Heat of Hydration of Portland Cement," abstracted from an article in the *Journal of Research* of the National Bureau of Standards, as written by Edwin S. Newman.

The article pertained to a study made of the precision of the heat-of-solution test for determining the heat of hydration of portland cement. Three operators participated in making six determinations each of the heat of hydration of a single portland cement sample. The results of their measurements were calculated by the specification method and by two reduced-observation methods, and a complete analysis was made of the variance of the data. According to the report, it was found there were no significant differences among these measurements obtained by the three operators and that the reduced-observation methods each gave acceptable results in these special tests. However, the agreement among the methods of calculation was somewhat poorer when they were applied to routine tests. The special tests indicated that the heat of hydration of portland cement can be determined by the heat-of-solution method with a precision of about 3 cal./per g. at seven days and about 2 cal./per g. at 28 days. It was stated that a somewhat better precision may be obtained by experienced operators.

Acme Materials Co., Tulsa, Okla., adds semi-portable crushing plant to supplement stationary limestone plant production



New portable crushed stone plant of Acme Materials Co., Tulsa, Okla. Five field hoppers are included in the assembly

Portable Plant Increases Output

IN JUNE, 1950, Acme Materials Co., Tulsa, Okla., purchased a new three-unit Cedarapids portable stone crushing plant. This plant is used for crushed stone and agricultural limestone production and is located 1½ miles north of Garnett on 110 acres of solid stone. The carloading track is on the Frisco railroad at Garnett.

This three-unit plant consists of a 25- x 40-in. primary crusher, a 12- x 36-in. twin-jaw reduction crusher and a 40- x 33-in. hammermill for finer materials, with a capacity from 100 to 200 t.p.h. The various units making up this plant are mounted on a concrete foundation, but can easily be moved. Three steel bins with hoppers are used for loading trucks. It is a dry plant and all materials are either trucked or shipped. Crushing units are driven by Caterpillar diesels. The conveyors to the bins are driven by electric motors.

The quarry is of the open face pit type, and has from 6 in. to 3 ft. of mixed earth and stone overburden. An International tractor with a Bucyrus-Erie bulldozer and a 75B Lorain shovel remove this overburden.

The limestone is approximately 32 ft. deep. For primary drilling, one Joy dual-wagon drill has been mounted on a Caterpillar D-8 tractor, along with a 500 c.f.m. Joy compressor. This assures a serviceable and efficient drilling operation. A new 79J Lorain is used to load four Koehring Dumptors and one Euclid truck in the pit. Trucks are loaded from stockpiles by a Barber-Greene loader and a Bucyrus-Erie ¾-cu. yd. shovel.

Acme Materials Co. operates an older plant at Gray, west of Tulsa, on the Arkansas river. This is a stationary plant with a capacity of 100 t.p.h. From both plants materials are shipped and hauled over all of northeast Oklahoma. M. W. Lewis is superintendent of operations.



General view of plant as seen from ramp to unloading hopper





The various units are mounted on temporary wood cribbing. Left: Part of the final screening, also hammermill, section of the portable plant. Right: Unloading hopper and primary crusher. An air hoist is located over the primary crusher to handle the larger rock



Left: The pipe line to the tailing pond is kept outside the berm at the Iron King mine. Right: The pipe line around the dike is split into two sections. The supports in the background have been raised for that half of the line. The pipe in the foreground is part of the other half which has not yet been raised to the new position. Note the rubber sleeve used to extend the pipe out over the top of the dike

CONTROL OF TAILINGS FROM WASHING PLANTS

Part VIII. Tailing line kept outside berm at Iron King mine of Shattuck Denn Mining Corp., Humboldt, Ariz.

By WALTER B. LENHART

THE IRON KING MINE of Shattuck Denn Mining Corp. is at Humboldt, Ariz., about 20 miles east of Prescott. In point of tonnage handled, Iron King mine is the smallest of the seven projects whose tailing control methods were observed in the Southwest, and the method of handling tailings differed somewhat from those previously discussed. One of the main differences at Iron King mine is that the pipe line carrying the tailings to the pond is kept *outside* the berm. This method has several advantages that will become more apparent.

The ore at Iron King mine is a pyritic material carrying values in lead, zinc, gold and some silver. It is a heavy sulfide, containing about 50 percent pyrite. The ore contains about 6 percent zinc, 2 percent lead, and gold closely associated with the pyrite. Three concentrates are made using selective flotation techniques; a lead, zinc, and a pyrite concentrate. Due to the character of the ore it is necessary to grind it extremely fine so as to make an effective separation of the values, yet with this fine material a tailing pond is made from it. However, the fineness of the tailings are offset by their relatively high specific gravity, for the rejects have a 3.8 sp. gr. It is quite doubtful that any of the rock products industries will have rejects of a comparable specific gravity, but that fact does not prevent the general technique from being used successfully. At Morenci, Ariz., it was said the method was in use on a porphyry copper ore with fineness in the same range as the porphyry coppers discussed in previous parts of this series. The porphyry tailings have a specific gravity of about 2.60.

Tailings

Tailings at Iron King mine contain 18 to 19 percent iron in the form of pyrite with the remainder of the material a chlorite schist. It is almost jet black in color and soft to the touch. Once in the tailing pile the material tends to set or solidify, possibly aided by oxidation of the iron pyrite.

As in all Arizona mining projects, tailings are impounded because of anti-stream pollution laws. At the Iron King the clear water flowing out of the decant line is wasted.

The fineness of tailings at Iron King mine during one typical month was as follows:

Plus 100 mesh	2.22 percent
Plus 150 mesh	5.80 percent
Plus 200 mesh	7.34 percent
Plus 325 mesh	17.53 percent
Minus 325 mesh	67.11 percent

The minus 325-mesh material varies from 67 to 70 percent. It was estimated that 50 percent of the rejects would be minus 1000 mesh. The settling rate was said to be 0.175 in. per min. and a recheck gave 0.186 in. per min. At the mill the rejects from the float plant are thickened from 28 percent solids to 40-45 percent solids and the water from the thickener re-used. The underflow of the thickener (40-45 percent solids) then flows by gravity to the tailing pond. No settling agents are added to the pulp.

Tailing Line

The tailing line is a double asphalt dipped, 6-in. diameter steel pipe using drive joints for the most part. However, where a permanent connection is made, flanged ends are used. The former type of steel pipe for a drive joint requires one end of the pipe to be slightly belled to slip over the connecting end. Double dipping this joint in hot asphalt makes a tight joint that will withstand the working pressures encountered. In each 1000-ft. section two expansion joints are provided. These are company made and consist of a 3-ft. section of steel pipe with an O.D. that allows it to be slipped easily over the 6-in. steel pipe line. It is asphalt dipped and when necessary can be caulked.

There are more than 1,000,000 tons

of tailings stored at Humboldt in three piles. The first pile made was nearest the mill, next to and below it the second pile was built, and the current tailing pond is below the second. It had about 100,000 tons of tailings in it at the time of inspection, and is receiving new material at the rate of 600 tons per 24 hr. One operator per shift is kept at the pond. Shifts change every two weeks. One of the older ponds has a face that has a vertical height of 70 ft. The bigger dam held 1000 tons of material per inch of height.

The total head or fall between the mill and the present tailing pile is about 100 ft., and the 6-in. line is carried to a point near the current pile by simply letting it rest on the ground, or where a small ravine has to be crossed the pipe line is supported on inexpensive wood trestles. Near the pond the 6-in. line goes to a concrete header box that has three 6-in. nipples embedded in the concrete. The header box is equipped with two 6-in. Nordstrom valves so that the tailings can be directed to either the north or south half of the pond as desired. The current pond is roughly triangular in shape and is 580 ft. across the berm with a clear water area of roughly 75 x 100 ft.

In all there are about 3000 ft. of 6-in. pipe in use. At the start of operations the pipe was 14 gauge and some of this pipe has been in use seven years. Ten gauge pipe has been specified in recent purchases. The pipe line is carried at a grade of 2½ to 3½ ft. per 100 lin. ft. At the berm the line is flattened considerably, but inasmuch as the pulp in the line is under pressure this is not too important.

The trestles across the berm are of 2- x 4-in. lumber, nailed construction. They are of such a height that most of the time the operator can reach the plug valve from the sand steps on the face. However, several short ladders are available. No walkway of planking is provided. Toe or mud boards are used under the legs of the trestles. Fig. 1 gives the general plan of the installation at the Iron King mine.

It will be noted that the flow is split at the header box and the flow comes down both sides of the pond and to the berm. Thus, if desired, all the pulp can come down one leg while the other leg is being raised.

Steps in Dam Face

The face of the dam is kept at a slope of 45 deg. and the operator keeps the face stepped as shown in Fig. 2. These steps are about 18 in. vertically and 18 in. horizontally and are kept uniformly level. In this system, keeping the berm true and level is important because the trestles to support the pipe line are (1) kept outside the berm and (2) they are constructed so that each trestle is 3 in. shorter than its neighbor. When desired to raise

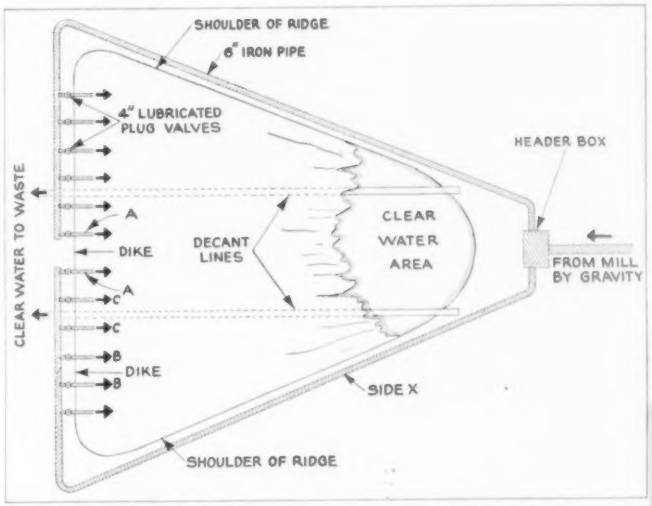


Fig. 1: General layout of the installation at Iron King mine. The pipe line is split in two sections so that the flow can be directed to either half of the tailing pond

the pipe line, all that is necessary is to move the trestle assemblies up hill and reset them on the mud boards. The grade requirements of the pipe line are thus kept uniform by having the trestles progressively 3 in. shorter and no alterations are required, also, no material is wasted or buried in the pile. Under this system the pulp can be pushed uphill a vertical distance of 15 to 20 ft. This means that raising the pipe line is necessary relatively infrequently.

After the pipe line has been raised it will resemble Fig. 2 with the short 4-in. pipe at "A" discharging its pulp behind the berm. It can have a 2- x 4-in. temporary post under its outer end as additional support as shown in one of the photographs. As the berm grows in height the assembly resembles Fig. 3. Here the trestle is still well below the berm and the pulp is flowing uphill (due to the hydrostatic pressure in the line) and discharging over the berm. Pipe line "A" in this latter case has been extended in length to reach over the top of the dam. These discharge or unloading pipe are approximately 8 ft. in length. Extensions are made by short rubber sleeves. Where the 4-in. pipe line leaves the 6-in. header there is a Nordstrom lubricated plug valve to control the flow of pulp. There are no valves in the 6-in. header line. The valves in use are now eight years old and still in good shape.

Across the face of the dam one of these 4-in. plug valves is provided every 40 ft. In cold weather it was found that this type of valve would freeze when in the closed position due to the pulp being retained in the valve,

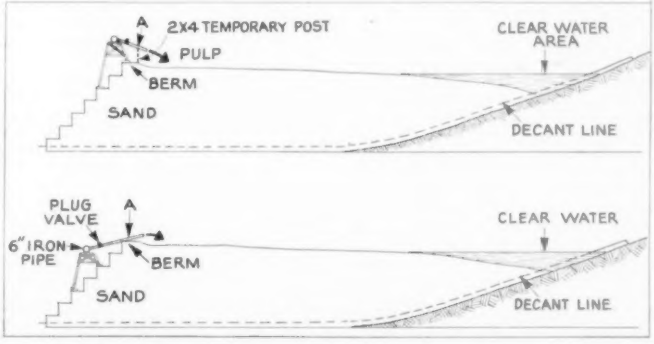


Fig. 2: (top): The trestle and pipe line are outside the berm; a short pipe is used at A at the beginning of disposal from the new position. The trestle is moved uphill as the pile grows. Fig. 3 (bottom): The pulp, due to pressure in the line, can flow up and over the berm as it is built up. The pipe at A is lengthened to reach over the top of the berm

so the operators drilled a ¾-in. hole near the base in such a location that when the valve is closed, the pocket within the core of the stem will be drained of liquid. Freezing troubles ended.

Flow of Pulp

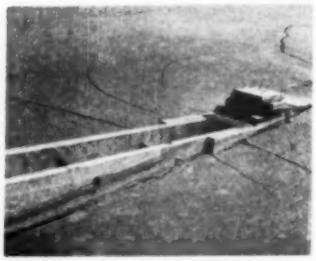
If pulp is flowing down the side marked "X" (Fig. 1) as many of the 4-in. plug valves can be opened as necessary to unload the line. One or two outlets usually suffice. For the sake of this discussion we will assume that the two valves marked "B" are in service, that these are near the shoulder of the berm, and are therefore slightly higher in elevation than the valves marked "C." The valve marked "A" is at the end of the line. Now with the pulp flowing as indicated above there might appear to be a possibility of the 6-in. pipe line sanding up below the opened plug valves (at "C" and "A") because of the dead pocket formed. In practice this does not appear to be the case. The dead end seems to be filled with air that acts to keep the pulp out of the end of the line. However, to prevent any possibility of the low end of the line sanding up here, the valve at "A" is opened twice per shift to flush out the line.

Tailing Pond

In starting the lower pond a trench the width of a dozer blade was cut across the shallow ravine to a depth of 2-3 ft. This was filled with mine waste and the sand berm toed against this dike. However, it is quite porous with large voids and the stability it adds to the pond is debatable. The berm is hand shoveled to keep it uniform and trim. By hand shoveling a berm 18 in. high and across the face of the dam the area can be used for six weeks. An improvised "dog-house" is provided on one shoulder of the berm; in it is a stove for the pond tenders.

The inner or wet part of the area is from 8-10 deg. from the horizontal. This relatively steep condition is possibly due to the high specific gravity of the solids. The surface of the berm drains and dries out rapidly but 3 ft. below the surface it is still apt to be mud.

Clear water from the back of the pond is taken off through two 10-in. decant lines that go under the berm. At the back of the pond the 10-in. pipe are enclosed in a box made of 2- x 12-in. timbers. They are laid on the ground which slopes gently. The top of the decant box is double planked for added strength and all joints are wicked. Every 3 ft., ½-in. spreader bolts (horizontal) are placed in the decant box. The top of the decant box is made up of short sections of planking, and as the water level rises, a plank segment is nailed in place in such a fashion that clear water can



The decant line is enclosed in a timber box at the back of the pond. A trash screen is fastened over the inlet

drain over the upper end of the plank into the flume. A trash screen is kept at the inlet. This is a crudely fashioned piece of coarse wire screen held in place by its own tension against the sides of the decant box. The decant line does not appear to have a tendency to float in the pulp.

The land area just above and around the pond has been ditched so that no storm waters can drain into the pond from that source, and the two decant lines have sufficient capacity to handle rain that falls directly into the pond.

The total cost of tailing pond control at Iron King mine, based on the tons of material going into the mill was $.0913 (9 cents) per ton for the first eleven months of 1949. Some 3000 ft. of pipe line was installed that year, these costs including pipe, its installation, trestles, labor, etc.

At the porphyry copper operation at Morenci, it was said that no trestles were used—the pipe line was simply carried on the berm, or on one of the steps below the berm and the flow of pulp carried into the pond by feeder lines much the same as is done at the Iron King mine.

One disadvantage of this system of having the pipe line outside the berm is that should a small leak develop the trickle of pulp could undermine one of the legs of the supporting trestle, causing it to sag and eventually collapse. This could cause the entire line to fall or break.

The main office of Shattuck Denn Mining Corp. is at Bisbee, Ariz. S. S. Shattuck is president of the company. H. F. Mills is general manager of the Iron King mine, with offices at Humboldt. Albert L. Pessin is concentrator superintendent.

Distributing Agstone

A NEW AGRICULTURAL LIMESTONE distributing plant has been opened by Homer Riddle at the old Maumee No. 30 coal mine on the Sullivan-Green county line, near Dugger, Ind. Limestone will be shipped by rail to this point and then hauled by truck to farms. The limestone will be obtained from Dunn Limestone Co., Spencer, Ind.

Magnesia Insulation by New Process

A NEW AND BETTER process for the manufacture of 85 percent magnesia insulation, reported to be revolutionizing the industry, is described by S. A. Abrahams, Philip Carey Manufacturing Co., Plymouth Meeting, Penn., in an article in *Chemical Engineering*, September, 1951.

The fundamental difference between the new and conventional processes lies in the chemistry of the manufacturing process and machine molding. The 85 percent magnesia insulation is made up of not less than 85 percent basic partially-hydrated magnesium carbonate and 10-15 percent asbestos fibers. It is effective for temperatures up to 550-600 deg. F.

In the new precision self-setting process, a needle-like crystal form of magnesium carbonate is produced from the magnesium bicarbonate solution, mixed with asbestos fibers and water, and cast into precision-sized molds. This mixture is converted into basic hydrated magnesium carbonate by the application of heat while still in the mold.

A light but strong monolithic structure is formed and the water removed through evaporation produces a high percentage of dead air space. The result is reported to be a product with a lower conductivity factor, higher strength-weight ratio and closer tolerances.

Self-set 85 percent magnesia differs from conventional filter-mold insulation in that the density is said to be more closely controlled, making it possible to produce a lighter and more uniform product. It has a density of from 10 to 11 lb. per cu. ft. compared to 13 to 17 lb. per cu. ft. in the filter-mold type. The lower density has a lower conductivity factor.

The new method of molding makes it possible to produce covering for pipe sizes of larger diameter than was possible or practical in the filter-mold process.

Dimensional stability has also been improved with the new process. After molding, drying shrinkage is only 0.25 percent. This enables the manufacturer to produce pipe insulation in extremely accurate sizes. In the conventional process, material is molded oversize because shrinkage and distortion during drying in the ovens cannot be predicted.

The process is also making possible the establishment of new simplified thickness standards for commercial pipe covering. The new process is now being used by four of the six manufacturers of magnesia insulation.

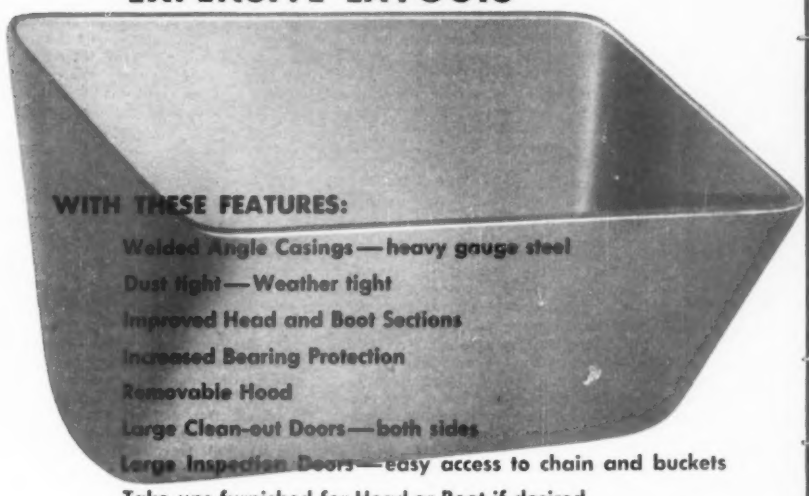
Reopens Plant

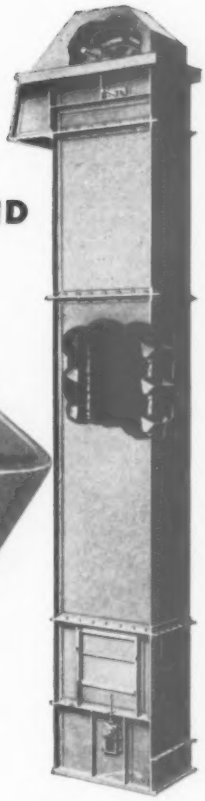
LARNED SAND & GRAVEL CO., Larned, Kan., has announced the reopening of its sand and gravel plant which had been closed since last May.

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A Jeffrey Centrifugal Discharge Bucket Elevator is shown here. Also Perfect Discharge, Vertical Continuous and Inclined Elevators—buckets mounted on chain or belt—can be supplied in standard sizes.

Bin Valves · Car Pullers · Conveyors · Crushers · Coolers · Dryers
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MINING CONGRESS FEATURES BENEFICIATION, DRILLING AND GRINDING

THE WESTERN DIVISION of the American Mining Congress, nonmetallic and metal mining section, held its annual meeting at the Biltmore Hotel, Los Angeles, Calif., October 22-24, 1951, with field trips scheduled for October 25-26. About 2000 mining men registered this nonexhibit year.

These annual meetings parallel other national conventions where material handling problems, industrial mobilization, defense minerals and labor relations and similar subjects receive attention. It was striking to note the similarity of the metal miner's problems to those of the rock products industries.

Heavy-Media Separation

Heavy-media separation was a subject covered by J. B. Baker, manager, E. C. Schroeder Co., Inc., Russellville, Ala., and was of interest from a rock products producer's viewpoint because the Schroeder Co. is also a producer of crushed stone in Alabama, and of sand and gravel in Iowa. The paper delivered by Mr. Baker related to the removal of gravel and other foreign material from iron-bearing materials in producing iron ore.

The speaker told of the use of a 6-x 6-ft. cylindrical drum-type Wemco separatory vessel which had a capacity of 100 t.p.h. The HMS process was operated under licenses of American Cyanamid Co. About 1,000,000 tons of iron ore is shipped per year from this operation, most of which was treated in the plant. The ratio of sink to float was 69:31. The ore had a 2.90 sp. gr. and ferrosilicon was used as the medium. The feed was minus 3 in. plus ¼ in. and the ferrosilicon all minus 65 mesh. About 1 lb. of ferrosilicon was lost per ton of feed and the total operating cost was said to be 23 cents per ton of feed. It was said that the drum-type separatory vessel was easier to operate, less power was required and gave a positive removal of the sink fraction. It also was mechanically easier to operate than the cone-type separatory vessel although it was pointed out that the cone gave better metallurgical results.

During the discussion it was asked if plus ¼-in. was the bottom or finest size handled by heavy-media separation and it was answered by Ralph Utt, Western Machinery Co., who said that on some types of materials, 3/16 in. and even ⅛ in. was being successfully processed. William Newton, Jeffrey Manufacturing Co., said that plus 65-mesh material was being handled in the cyclonic type of separatory vessel. Mr. Blain of American Cyanamid Co. said andalusite was being processed at a bottom size of 28 mesh. Ed. Bitzer, Colorado Iron Works, asked about the middlings in the drum-type of separator and it developed that none were being produced at Russellville. It was also brought out that a difference of 0.10 in specific gravity of the sink and the float fraction provided a safe working limit.

Kellogg Krebs, metallurgical consultant, San Francisco, Calif., told the audience of the Centriclone classifier that he was manufacturing. This is a wet, cyclone-type of separatory vessel and the incoming pulp entering the top of the unit at a tangent receives added centrifugal motion due to rotating feeder arms. From the description given, the machine has considerable promise as a means of separating fine sands from slimes and at high pulp densities.

About 33 units are in service to-date and a few have been shipped to portland cement operators, the speaker said. One cement plant intended to use the unit to separate the "hinge" or gristle portion of the cement slurry (made from oyster shells) from ball and tube mill products.

Drilling

A. J. Zinkl, assistant superintendent, Iron King mine, Shattuck Denn Mining Co., Humboldt, Ariz., told of his company's conversion to tungsten carbide bits about two years ago and of test work to determine the proper size of machine which would be the most economical for these bits.

The analysis showed that the medium weight drill such as the stoper with ⅞-in. steel and 1½-in. bits gave the best economies. He showed that a drill could be too heavy (or too light) and there was a definite cost relationship between size of steel, size of drill, and diameter of hole with tungsten carbide bits.

Earl M. Holmes, assistant superintendent, Oliver Iron Mining Co., Soudan, Minn., told of drilling experiences in northern Minnesota and said that the Soudan jasper was reputed to be the hardest rock that is regularly drilled in commercial mining in the United States. The mine produced some softer ores also, he said.

Records showed that with solid forged steel it averaged less than 2 in. per hr. and used ten pieces of steel per in. when drilling the jasper. Tests were made with jet piercing and various drills and bits but during the past six years about 90 percent of Soudan iron ore was mined by blast holes drilled with rotary drill machines using EXT diamond impregnated coring bits. Tests were underway using light machines and tungsten carbide bits which gave promise of cutting costs up to 35 percent on some of the ores. In drilling such hard material the speaker said that machines should be about 2½ in. and strike light, fast blows, with a strong but slow rotary rotation, preferably with a cushioning effect such as that obtained with an air column mounted, reverse feed stoper. Rods with large threads which fit tightly with close tolerances were used; bits should be 1¾ in. with wide heavy wings to back up the tungsten carbide inserts. Bits should be reground often and not allowed to become dull. He said some bits had been sharpened as many as 15 times before the insert shattered.

R. W. Adamson, Ingersoll-Rand Co., told of the use of lightweight air-leg drills. This is a device intended to be used with jackhammers or similar type drills wherein the drill is used for flat or breast holes. Its application in the rock products field appeared to be in coyote type holes, in small drifts and tunnels, and similar usages.

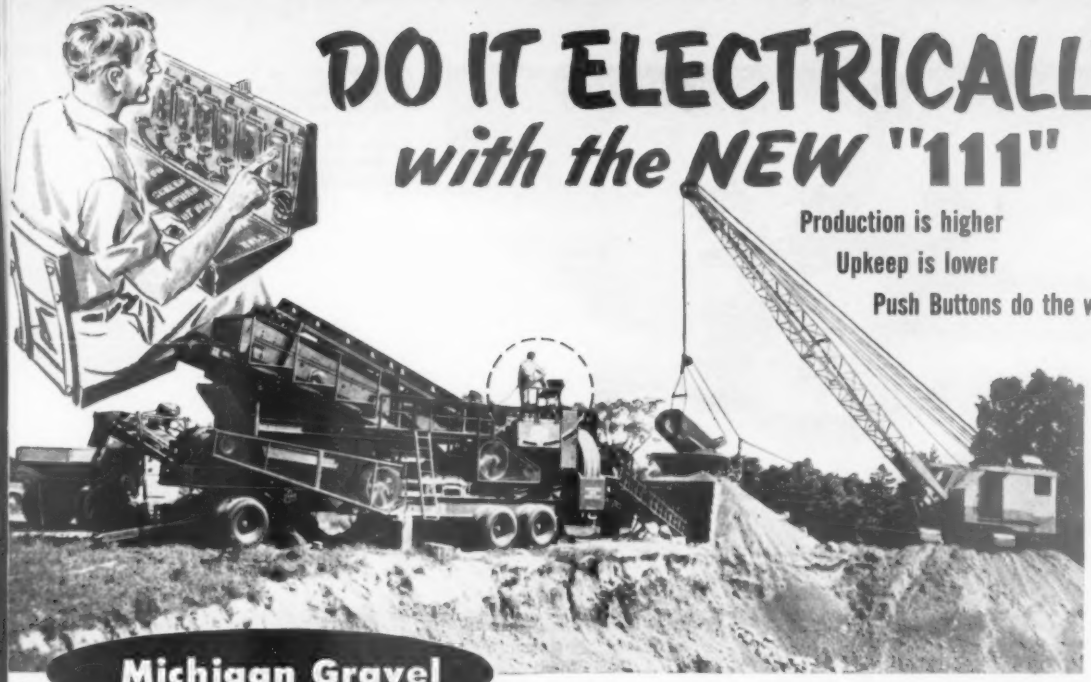
Grinding

Charles H. Segerstrom, Jr., president, Nevada-Massachusetts Co., Sonora, Calif., told of grinding experiences relating to the grinding of calcium tungstate (scheelite). He said rod mills were better than ball mills for this work and that rods could be used in a ball mill if the breast and discharge end liners were designed with rods in mind.

One whole session was devoted to problems encountered in shaft sinking. On the final day of the meeting, Ronald C. Griffin, production manager, Consolidated Rock Products Co., Los Angeles, Calif., told of the 1000 t.p.h. sand and gravel operations of its Irwindale plant. He illustrated his talk with slides. The Irwindale plant is one of the West's largest material handling operations and was inspected by the 1947 sand and gravel conventioneers at the national meeting held in Los Angeles that year, and described in the October, 1950, issue of ROCK PRODUCTS, page 101.

DO IT ELECTRICALLY
with the NEW "111"

Production is higher
Upkeep is lower
Push Buttons do the work



Michigan Gravel

Production is higher—because each unit has its own electric motor drive; thus operates at top speed and efficiency at all times.

Upkeep is lower—because drives are simple and have few parts.

Push buttons do the work—the man on the platform starts and stops the feed and delivery conveyors, and has other units under complete control.



Primary Breaker units are made in several sizes; this one has a 3' x 10' apron feeder, 20" x 36" jaw crusher, power unit and delivery conveyor—all mounted on pneumatic tires.



Carolina Rock

The high production "111," with its 10" x 36" jaw and 40" x 24" roll crushers, is equally at home in gravel and rock. On this quarry job, production is still further increased by using a Primary Breaker unit with 32" x 40" jaw crusher (not visible in the photograph) to reduce the oversize to about 5 inches.

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BALDWIN BLH LIMA-HAMILTON



Loading the first truck at the Marblehead quarry after a record-breaking erection of the 200-ton shovel in 46½ hr. The shovel arrived at Marblehead and unloading began by an eight-man crew at 12:30 p.m., August 22. Erection was continued on a 24-hr. basis until the shovel was operated at 11:00 a.m., August 24. Total man-hr. required for erection were 682 hr., 542 for mechanical and structural erection, 140 for electrical erection

RECORD FOR SPEEDY SERVICE

THE EDITOR: The Kelley Island Lime and Transport Co. placed an order for a P&H 6-cu. yd. electric shovel promised for delivery in June, 1951. As is usual these days, delivery was delayed. The shovel was to be used at Marblehead, Ohio, to increase the production of blast furnace fluxstone to supply the steel industry. Although our Marblehead operation was working 24 hr. daily, we were unable to produce enough fluxstone to satisfy the hungry blast furnaces. Shipment of the shovel was finally made from Milwaukee on August 15, consisting of four carloads, which, because one of the cars exceeded the railroad limits for clearance, meant slow movement over the railroads, but constant tracing resulted in delivery at Marblehead on August 22.

Robert C. McDowell, president of the McDowell Co. of Cleveland, when asked if he would undertake to break the world's speed record for erecting the shovel, said, "I never saw a 6-cu. yd. P&H shovel, but if you'll give me a few days to organize the job I'll take a cut at it." The production from the shovel was needed so much that the McDowell Co. was given the erection job. The manufacturer also sent an erection engineer and an electrical engineer to supervise the erection. Arrangements were made with the New York Central railroad to send its 150-ton wrecking crane to Marblehead to help out with the heavy lifts.

The first lift was made at 12:30 p.m., August 22, and the shovel was digging into stone at 11:00 a.m., August 24. Total elapsed time was 46½ hr., thereby establishing a new record for assembling this type of equipment from freight car to operation. The previous record of 52 hr. was held by Spruce Mine of the Oliver Mining Co., Duluth, Minn.

In addition to the outstanding erection job done by the McDowell organization, credit should be given to the following men for their part in getting this shovel digging fluxstone for shipment to the various blast furnaces of the steel industry in less than 48 hr. after being delivered by the railroad at Marblehead: N. D. Shafer, superindent of the Marblehead plant of The Kelley Island Lime and Transport Co., for preparing the site, building roads, building a power line, and for his cooperation with the McDowell organization. The men from the Marblehead organization who delivered in a pinch when called upon were: M. J. Stevens, master mechanic; Jack Monok, crane operator; George Hudack, Joe Hudack and Paul Glovinsky, millwrights; Rollin Dehring, mechanic; Clarence Sauvey, welder; and others.

Credit also goes to the following: George Earls, trainmaster of the Lakeside and Marblehead railroad for his prompt handling of the cars from Danbury to Marblehead and prompt switching service when required; F. B. Gill, assistant superintendent, New York Central railroad, Toledo, for his fast movement of the four cars on which the shovel was loaded and prompt delivery of same to the Lakeside and Marblehead railroad; F. T. Connor, general car foreman of the New York Central railroad at Toledo; Charlie Heinisch of the New York Central railroad Cleveland office; the entire crew of the New York Central wrecker which made the early heavy lifts; John Lumree and R. D. Geirsch, P&H erection engineers; Harold Banks of the McDowell Co. who picked the site and planned the job and had general supervision of same. He had very little sleep from Tuesday morning to Friday night; and Fred Niggemyer, sales manager of the McDowell concern, who had general supervision of the job on one shift.

Last but not least—Robert C. McDowell, president of the company, originator of the McDowell method, who started in business at 32 years of age seven years ago with $10,000 invested capital and which has grown into an organization of over 800 men, with $15,000,000 business in 1951 and an $18,000,000 backlog for 1952. Some of his personality and genius for getting things done went into this job.

A job every one said couldn't be done, but it was done.

A. B. MACK
Executive Vice-President
The Kelley Island Lime and Transport Co.
Cleveland, Ohio

Percentage Depletion

THE SENATE FINANCE COMMITTEE, on September 5, officially approved the House recommendation of a percentage depletion of 15 percent on chemical and metallurgical limestone, along with a number of other nonmetallics, and 5 percent on crushed stone and sand and gravel. The depletion was then announced as a closed issue. However, on September 6, the Senate Finance Committee reopened the whole percentage depletion issue and made a number of changes in the Tax Bill, H.R. 4473. Among the changes made were recommendations that depletion allowances on chemical and metallurgical limestone and other nonmetallics be reduced from 15 to 10 percent. Percentage depletion on crushed stone and sand and gravel remained at 5 percent after the Senate changes. These allowances have been incorporated into the new tax law signed recently by the President.

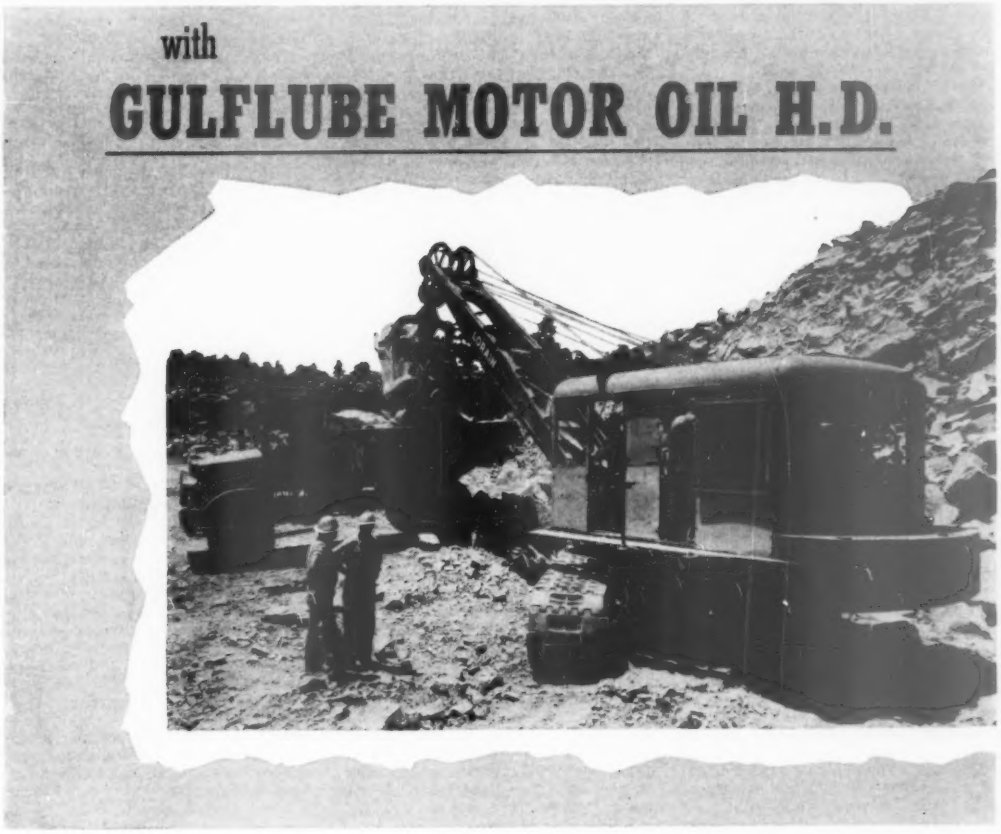
Cement Plant Expansion

CAROLINA GIANT CEMENT CO., subsidiary of Giant Portland Cement Co., recently received administrative approval of a certificate of necessity for its $4,671,310 expansion program at its Harleyville, S. C., plant. Plant capacity is to be increased by approximately 1,000,000 bbl. of cement per year.

Protect high-speed Diesels in quarry service against ring sticking and excessive wear

with

GULFLUBE MOTOR OIL H.D.



High-speed Diesels in dusty quarry service need high quality detergent-dispersant oils, the type depending on the severity of service.

For the majority of engines Gulflube Motor Oil H.D. is recommended. This high quality oil has a rich paraffin base and sufficient detergency to protect Diesel engines under most operating conditions.

For engines in low temperature operation, extra heavy-duty operation or for those using high sulphur fuels, Gulflube Motor Oil X.H.D. or Gulf Super-duty Motor Oil may be the preferred recommendation. They contain larger quantities of detergent and have alkaline properties which prevent corrosion of cylinder walls, and resulting wear under these severe operating conditions.

For additional information leading to better lubrication and maintenance of your Diesel engine, call in a Gulf Lubrication Engineer. Write, wire or phone your nearest Gulf office.

FIFTY YEARS OF SERVICE

1901 GULF 1951

PETROLEUM AND ITS PRODUCTS

Cement Production Overseas

ARGENTINA cement output in the first half of 1950 totaled 752,000 metric tons, or an increase of 4.5 percent over the first half of 1949. However, cement remained in short supply despite the fact that domestic output was supplemented by imports approximating 250,000 tons.

IRAN'S Rey cement-plant extension has been listed in the "Summary of Bank Loan Applications," prepared by the Overseas Consultants, Inc., for a loan of $1,700,000. Part of the equipment was ordered in Germany and the rest is expected to be ordered from other European countries.

SWEDEN'S total cement production capacity has now reached approximately 2,000,000 metric tons annually, as a result of the addition of a second kiln to the largest producer's (Skanska Cement AB) plant at Stora Vika, near Stockholm. Each of these two kilns has a capacity of 150,000 tons annually. Swedish production of cement in the first half of 1950 totaled 874,400 tons. Cement exports have also increased considerably in the past few years, from a total of 10 metric tons in 1947 to 59,239 tons in 1948 and to 278,384 tons in 1949. Export shipments for the first six months of 1950 totaled 120,232 tons. The major recipients of Swedish cement in 1949 and the first half of 1950 were South Africa, India and South America, in that order.

THE CHI HAIN CEMENT CO. of Hong Kong produced 194,500 tons of cement in 1950, exceeding its 1949 output by about 14,000 tons. Total sales during 1950 were 162,110 tons, compared with 149,000 tons in 1949.

THE ASSOCIATED CEMENT COMPANIES, LTD., are building a new cement plant in Sevalia, India (Gujerat, Bombay State). The new plant is expected to produce 200,000 tons of cement per year when it reaches capacity performance. The total capacity of the cement industry in general was estimated at 3,100,000 tons at the end of 1950. Additional production capacity expected from plant expansions is 360,000 tons in the first half of 1951 and 600,000 tons in the second half.

PORTUGAL'S new plant at Figuera de Foz, with a rated capacity of 100,000 metric tons, has increased the total Portuguese cement capacity to 700,000 tons per year. It is expected that this will meet the country's entire normal requirements for cement. Production, which reflected the completion of the new plant, rose from 521,435 metric tons in 1949 to 572,549 tons in 1950. Imports declined from 70,306 tons in 1949 to 11,453 tons in 1950, the imports being mostly from Czechoslovakia. Exports increased from 9506 tons in 1949 to 49,988 tons in 1950.

SPAIN'S total output of cement, including natural cement, in 1949 was 2,247,610 metric tons, compared with 2,330,850 tons in 1948. In 1949, 34 plants produced portland cement and 104 plants produced natural cement. Cement production in 1950 was 1,933,784 metric tons of portland cement and 169,318 tons of other cement.

PHILIPPINE REPUBLIC'S cement production totaled 1,749,637 bbl. (299,187 metric tons) valued at 11,652,333 pesos in 1950. A distinct decline in the sales of the Cebu Portland Cement Co., the chief producer, has been reported, due chiefly to a decrease in public works activity and a drop in private construction. At the end of 1950, cement stocks were accumulating and the Cebu company planned a temporary cutback in output.

SOUTHERN RHODESIA'S cement industry is to be extended, due to shortage of domestic cement caused by increased migration into the country and the consequent expanded building activity. Rhodesia Cement Co., at Colleen Bawn, is installing a new kiln and grinding mill. The installations are expected to increase Southern Rhodesian cement production by about 48,000 tons per year, which is about half of the total quantity now being imported. Rhodesia Cement Co. will have a kiln capacity of 192,000 tons per year when the new kiln is installed.

THE UNION OF SOUTH AFRICA began cement rationing in the Cape on January 31, 1951. Although cement output in this area is normal, it is inadequate to meet present demands. The weekly quota to be delivered is based on the quantity supplied through the account of each merchant during the period February 1 to November 30, 1950. The allocation is based on normal expectations, but it may be varied pro rata should output alter considerably or additional supplies become available.

DENMARK'S cement production increased from 833,000 metric tons in 1949 to an estimated 878,000 tons in 1950, due chiefly to the installation of new kilns in one of the most important plants. However, the industry is still unable to meet the demand for cement, caused by the increased building activity. Exports have decreased slightly. Manufacturers found it necessary to apportion their production at the beginning of 1950, but the system was abandoned after the installation of the new equipment. The cement industry is centered in Jutland where raw materials are readily available and good harbor facilities exist. The industry dates from 1873 when the first cement-manufacturing plant, the "Cimbria" works, was founded at Mariager Fjord. This plant is still in operation. Cement is an important factor in Denmark's export trade. The quantity of Danish cement exports in 1949 almost reached the prewar level, while the export value was almost quadrupled. Most of the 1949 exports were to Indonesia, Brazil and Iceland.

ISRAEL'S total sales of cement produced in 1950 were reported at 380,000 metric tons, and imports were listed at 82,000 tons. As none was exported, the apparent total consumption amounted to 426,000 tons for the year. Palestine Portland Cement Works, Ltd. (Nesher), is the only cement plant in Israel. The plant has two rotary kilns, one of which was installed in 1950, and six shaft kilns. The two rotary kilns are wet process. The new kiln is expected to increase production in 1951 to 500,000 tons.

These reports were taken from *Mineral Trade Notes*, January, March, April and May, 1951, issues.

Japanese Cement

THE JAPANESE CEMENT INDUSTRY has shown steady increases, according to figures recently released by occupation authorities. In April, production of cement and cement clinker reached new postwar highs of 549,000 and 534,000 metric tons, respectively. Present cement production is closely approaching the all-time Japanese high of 582,000 metric tons set in November, 1940.

Rocky's Notes

(Continued from page 77)

flocculation, resulting in larger pores and capillaries?

There is a paper on "The Surface Structure and Composition of Colloidal Siliceous Matter"* by Dr. Ernst A. Hauser, D.S. Le Beau and P. P. Pevear, which all researchers in concrete would find stimulating.

Among conclusions are: "Systematic studies of various natural siliceous compounds by infrared absorption studies and differential thermal analysis have revealed that the surfaces of siliceous matter are composed primarily of hydroxyl ions." Their studies "offer a visual experimental proof that the colloidal properties exhibited by these siliceous compounds are primarily due to their surface configuration and not to their internal crystal structure . . . It is therefore not the chemical composition, but primarily the surface configuration which is the basis for the reactivity and colloidal properties of siliceous matter. On the basis of these findings it is postulated that the reactivity of a siliceous colloid is primarily based on the ionic structure of its surfaces and that ion exchanges within the crystal structure are of secondary importance only."

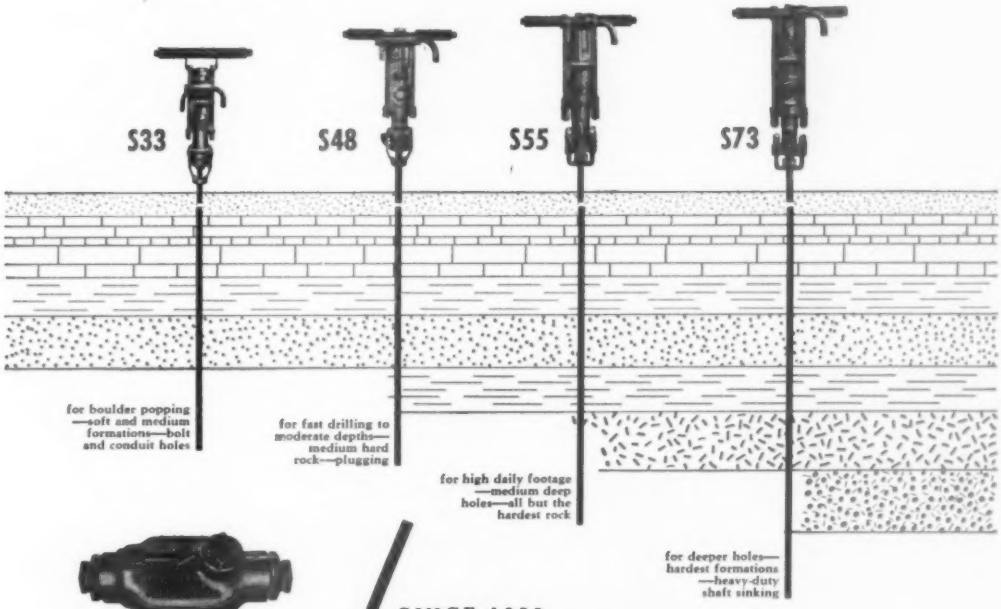
That is, apparently, a scientific way of saying what we have hazarded as an opinion several times before, that the so-called silicates in hardened cement pastes are only silica lattices or framework to which the various ions of calcium, hydroxyl, the alkalies, and possibly also the aluminum and iron ions, are caught and held rather than being actual replacements or substitutions in the crystal lattice.

**The Journal of Physical and Colloid Chemistry*, Vol. 55, No. 1, January, 1951.



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No matter what kind of rock you find underfoot—there's a Gardner-Denver Sinker of the correct weight and power for lower drilling costs. Every model is designed for fast penetration—powerful rotation—clean blowing—easy holding—low air consumption. Bulletin HHD-11 gives all the facts. Send for your copy today.



Drills can't run dry when the LO12 Automatic Oiler guards your air lines. It stops the flow of air when it runs out of oil.

SINCE 1859

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois
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THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

BELTING
BUILT FOR THE TOUGH JOBS!



HEWITT-ROBINS Conveyor Belting gives longer service at less cost

When trouble comes by the ton . . . whether it's heavy abrasives like ore and rock or wet, gritty materials like fines and slag . . . the easiest, most dependable and most economical way to move it is on a Hewitt-Robins conveyor belt.

For over half a century the Hewitt Rubber Division of Hewitt-Robins Inc., has pioneered in making the right belt for every conveyor installation. Today, engineers the world over instinctively specify Maltese Cross® where the going is really tough, Ajax® for general service, and Conservo® for lighter applications and portable conveyors.

In Hewitt Rubber belting they get full protection against moisture, oils, flexing and ply-separation, as well as treatment against mildew. They get abrasion-resistance from extra-tough rubber covers, heavily textile-reinforced for maximum strength plus flexibility.

* * *

Engineers turn to Hewitt-Robins not only for belting but for entire belt conveyor systems. They know Hewitt-Robins is *the only firm able to accept complete responsibility*. For belting, address Hewitt Rubber Division, Buffalo 5, N. Y.; for machinery, Robins Conveyors Division, Passaic, N. J.; for engineering services, Robins Engineers Division, 157 Chambers St., New York.

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Labor Relations Trends

(Continued from page 79)

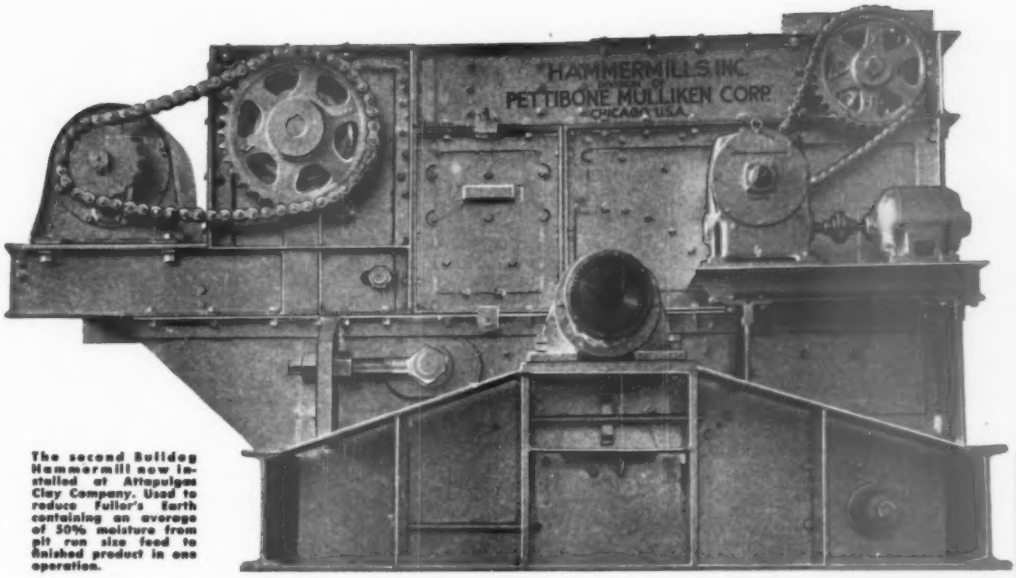
serve differentials between common or skilled labor and its supervisors, merit and length of service increases, rating jobs higher, the problems of new employers who had no base period to start from, etc., etc. One might go on indefinitely.

It all adds up to wage and salary increases not foreseen or contemplated by the Congressmen who voted for the law in their apparently innocent belief that it would accomplish the intended purposes. For example, the Secretary of Labor establishes wage rates for employers under the Davis-Bacon Act without regard to the regulations of the Wage Stabilization Board. We have quoted enough from emanations of the Secretary of Labor to show where he stands. In the case of the new employer, if he needs the labor badly enough and has a defense contract, he may fix his wage rates at the highest in the locality and thus entice employes from more seasoned and steadier employers.

There are logical ways of meeting some of these problems, which are obviously devices invented by human ingenuity to beat anything resembling a wage freeze. For example, the industry members of the Wage Stabilization Board would take care of increased health and welfare benefits by having the employes themselves contribute half the additional expense. This would serve at least two purposes of making the employes have a more direct interest in preventing further inflation of their dollars when it comes to death, retirement or disability payments, and of contributing directly to prevention of inflationary forces by diverting their surplus to savings rather than running up prices of goods in short supply. However, the majority of the board favored the labor members point of view that such fringe benefits be entirely independent of wage regulations. So the board recommended "flexible" stabilization rules.

Purpose Of It All

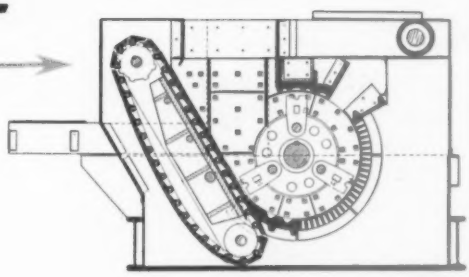
In conclusion we would like to remind readers of the purpose of the Defense Production Act of 1950, which provided for the establishment of the Wage Stabilization Board, the OPS and all the other members of the "Army of Regulators" who hamper manufacturers and producers and eat up our taxes. In the words of the Act itself: "It is the objective of this Act to provide the President with authority to accomplish these adjustments in the operation of the economy. It is the intention of the Congress that the President shall use the powers conferred by this Act to promote the national defense, by meeting, promptly and effectively, the requirements of the military programs in support of our national security and foreign poli-



The second Bulldog Hammermill now installed at Attapulgus Clay Company. Used to reduce Fuller's Earth containing an average of 30% moisture from pit run size feed to finished product in one operation.

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For wet, sticky material reduction . . . for those tough, heavy-duty crushing jobs.

Illustrated above is the last word in Moving Breaker Plate Hammermill design. It is built by an engineering organization whose experience far surpasses any organization that might furnish Moving Breaker Plate crushing equipment.

Design Improvements have increased reduction efficiencies and lowered H.P. requirements. You can see this equipment in operation at any time. Also Hammermills will gladly survey your reduction requirements and recommend the proper equipment without cost or obligation. Just write or call.

Bulldog Hammermills are built in capacities up to 1000 tons per hour for every purpose: for primary, secondary, fine reduction of materials such as limestone, shale, Fuller's Earth, phosphate muck, phosphate mud balls, iron ore, oyster and clam shells, any reducible material.

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FOR Positive Controlled Feed by Weight of Sand Gravel, Lime Clinker, Gypsum or other materials to Process—

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cy objectives, and by preventing undue strains and dislocations upon wages, prices, and production or distribution of materials for civilian use, within the framework, as far as practicable, of the American system of competitive enterprise. It is the intent of Congress to provide authority necessary to achieve the following purposes in order to promote the national defense: To prevent inflation and preserve the value of the national currency; to assure that defense appropriations are not dissipated by excessive costs and prices; to stabilize the cost of living for workers and other consumers and the costs of production for farmers and business men," etc., etc.

In retrospect, doesn't that read more like a political party platform than a majestic law on the statute books of the United States of America? Where the Wage Stabilization Board fails to make much of a real effort to stabilize wages, the individual manufacturers, even with the most progressive ideas, cannot make progress because of interference of other government labor regulating bodies.

An Example Case

For example, here is the case of the National Gypsum Co., which is known far and wide for its liberal attitude toward labor. In 1950 the company made a contract at its Kimballton, Va., lime plant with the United Construction Workers (UMW) which was to expire August 1, 1951. To meet the obviously inflationary conditions of March, 1951, the company made a supplementary agreement with the union to provide certain wage adjustments to provide for the increased cost of living, in return for which the union agreed to extend the contract to March 1, 1952. Thus the employer tried to stabilize his own labor costs for at least a year.

What happened when a rival union brought this to the attention of the National Labor Relations Board? The board held that this was an illegal, premature extension of the contract; that it did not permit the employes to change their bargaining representatives at the legal expiration date, should they so desire. The complaining union was, as can be guessed, the CIO United Gas, Coke and Chemical Workers of America. The board ruled that there must be an election to determine whether the employes of the company wanted to continue with the same bargaining representatives, but, and here is the joker, since the intervenor (the United Construction Workers), which is one of John L. Lewis' union organizations, is not in compliance with the filing of the non-Communist affidavit requirements of the amended National Labor Relations Act, it must be left off the ballot! Can you beat it?

THERE'S MORE THAN MEETS THE EYE IN





HAMMOND Multi-Wall BAGS

Satisfied customers in the cement and rock products industries know that all multi-wall bags are not alike. The combined efforts of progressive management, conscientious and thoroughly trained personnel, and expert sales engineers who thoroughly understand the problems of shipping hundreds of products—are the primary reasons for the superiority of Hammond Multi-Wall Bags. *Write for booklet—"To Serve You Better with Hammond Multi-Wall Bags."*

Photo shows "tubes" coming off large tuber, from which they are conveyed to sewing machines, where they are made into *Sewn Type* Multi-Walls.

HAMMOND BAG & PAPER COMPANY

General Offices: Wellsburg, W. Va.

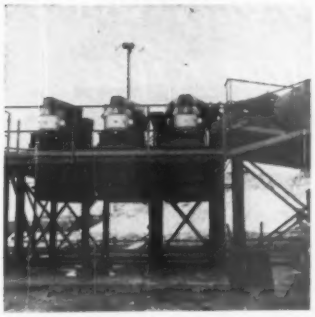
Plants in Wellsburg, W. Va. and Pine Bluff, Ark.

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Philadelphia, Pa. Columbus, Ohio, Charlotte, N. C. Ligonier, Pa.
Houston, Texas Kansas City, Mo. Baltimore, Md.

Spiral Concentrators

(Continued from page 93)



The crude concentrates from the spirals are scrubbed in these three agitator-type scrubbers in series, and dewatered in a rake before going to the dryers

developed by J. Hall Carpenter, of Carpco Engineering and Manufacturing, Jacksonville, Fla., and Humphreys Gold Corp. This equipment was developed from electrostatic-type separators but differs inasmuch as a comparatively high current flow occurs between the electrode and the rotor. It consists of rotating horizontal steel rotors about 6 in. in diameter and 60 in. long and a beam electrode operating at 40,000 volts. The zircon and the other silicate minerals adhere to the rotor and are removed by brushes. In the zircon plant are four, 4-rotor high tension machines and two, 10-rotor induced roll Dings magnetic separators.

Personnel

The Humphreys Gold Corp. staff at Trail Ridge is under the direction of Jay P. Wood, vice-president and general manager. Other personnel include C. R. Hager, plant superintendent; W. J. Siprelle, production superintendent; C. J. Bastedo, plant engineer; J. C. Detweiler, technical superintendent, and S. L. Jackson, office manager.



One of the rake dewaterers ahead of the spiral roughers





THOMAS DREDGE PUMPS *Do a Mighty Good Sand & Gravel Job on Ole Man River*

The Girod Company, Inc.
Vicksburg, Mississippi

26 October 1951

Thomas Foundries, Inc.
Birmingham
Alabama

Gentlemen:

Early in 1950 we installed our first Thomas Pump, Series LL, with 14" suction, 12" discharge for pumping sand and gravel from the Mississippi River.

This Thomas Pump did an outstandingly good job, both as regards production of a large quantity of material per hour and showing surprisingly long service life.

As you know, we ordered a spare set of parts after several months, assuming that these parts would be needed, and this was based on our past experiences. When the pump was finally opened up we were very much surprised to note the excellent condition of the parts and the fact that they were not needed at that time.

Our experience with the original Thomas Pump was so excellent that when additional production was required we placed an order with you early this year for another identical Thomas Pump for use on our second dredge, and this has now been in service for several months.

Our experience with the Thomas Pumps has been most pleasing. We also like very much the fine cooperation you have given us in the use of this equipment.

Yours very truly,

The Girod Company, Inc.

Fred Girod

Fred Girod, President

FG/jwo



One of Girod Company's Thomas Pumps in operation.

Mr. Girod - Says

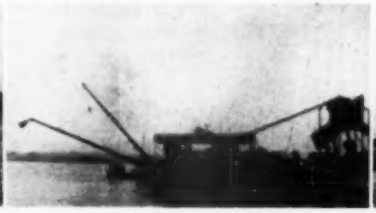
"We liked first one so well that we have installed SECOND THOMAS Pump"

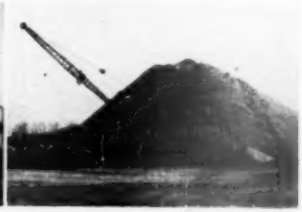
Mr. Girod has used Thomas Dredge pumps for nearly 2 years and knows what he's talking about. He has proved to himself by experience that his Thomas Pumps give him increased production and longer service life. Imagine his surprise and pleasure when he found out that the spare parts he ordered were not needed.

Mr. Girod is another sand and gravel man who finds that the special design of Thomas pumps which permits the use of metal highly resistant to abrasion, shows up on the profit side of his office ledger. We realize that some of our claims (Thomas Pumps have 3 to 6 times greater service life) have sounded like exaggeration. But you can't fool the man who owns one. Mr. Girod says our claims are facts—facts that may be helpful to you. Write for illustrated folder. THOMAS FOUNDRIES, INC., BIRMINGHAM, ALABAMA.

Girod Company's stock piles of sand and gravel and general view of one of the Girod dredges in operation on the Mississippi River.







INFORMATION

TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

You can obtain catalogs listed on these pages by merely checking and mailing the coupon below

1 **BAGS**—Chase Bag Co. has available for distribution a 16-page booklet, entitled "Worth Looking Into," describing the company's purchasing policies; laboratory, research, engineering and manufacturing facilities; and illustrating the complete line of textile, paper and film containers and packaging materials made by the firm.

2 **BINS**—Pioneer Engineering Works has released a pamphlet, Form No. 629, illustrating and describing storage bins and loading bins. Sizes, specifications and applications are covered, together with the types of bin gates available for discharging the bins. Included are single and multiple compartment bins up to 45-cu. yd. capacity.

3 **BUCKET LOADERS** — George Haiss Manufacturing Co., Inc., Division of Pettibone Mulliken Corp., has published Bulletin No. H 75-77, describing and illustrating bucket loaders with capacities of 3 cu. yd. per min. Diagrams, specifications and photographs are included.

4 **CLASSIFIER**—Equipment Engineers has released a bulletin on its Centriclone classifier, which is a combination of the conventional cyclone and centrifuge. Operating principle and performance data are included in the release, as well as a cutaway view of the classifier.

5 **COMBUSTION METERS** — The Hays Corp. has published a 4-page release, No. 51-853, describing and illustrating its combustion meters (CO_2 recorder). Complete diagrams and explanations are furnished concerning operation and installation. A selector chart also is included in the folder.

6 **COMPRESSORS**—Fuller Co. has published Bulletin C-8, entitled "Fuller Rotary Compressors and Vacuum Pumps." Diagrams, photographs and complete descriptive information are included.

7 **CONCRETE TESTING** — Baldwin-Lima-Hamilton Corp. has issued a 2-page bulletin, No. 327, on the Baldwin hydraulic testing machines of 100,000 lb. capacity. The brochure covers hydraulic loading, independent hydraulic load weighing, accessories and specifications.

8 **CONVEYORS**—Stephens-Adamson Manufacturing Co. has issued a 20-page bulletin, Vol. 196, with illustrations and descriptions of its conveyors and conveyor systems. Many applications are discussed and pictured in the publication.

9 **COUPLINGS**—Naylor Pipe Co. has issued a 4-page folder, Bulletin No. 514, describing and illustrating the low-pressure wedge-lock coupling, designed for connecting lightweight pipe in ventilating and similar low pressure service. Included are complete specifications on pipe sizes from 8 to 30 in. in diameter.

10 **CRANES**—American Hoist and Derrick Co. has released Catalog No. 400-R-3, featuring revolver cranes in industrial use. This pictorial booklet contains views of the cranes working at ports and industrial plants throughout the world. Contents include short job stories as well as rated lifting capacities of the five standard models.

11 **CRUSHERS**—Smith Engineering Works has released Bulletin No. 265E, entitled "Telsmith Portable Crushers," describing in detail the portable and semi-portable units manufactured by the company. Complete photographs and diagramatic sketches are featured.

12 **CRUSHING & SCREENING** — Diamond Iron Works, Inc. has announced the release of a 4-page bulletin, No. SMD-1, featuring its line of aggregate crushing, screening and washing equipment. Descriptions, sizes and illustrations of the units are included.

13 **DIESEL ENGINES** — General Motors Corp. has published a loose-leaf master parts catalog for release to the division's distributors and dealers. This catalog covers the entire range of Series 71 diesels and includes all optional accessory equipment.

14 **DIESELS**—Nordberg Manufacturing Co. has announced the publication of Bulletin 191, containing 12 illustrated pages describing the company's Supairthermal engine, a 4-cycle diesel, duafuel or spark-fired gas unit. Actual comparative data is included in the release.

15 **DRILL BITS**—Western Rock Bit Manufacturing Co. has released a catalog, entitled "The Fast Drilling Liddicoat Detachable Drill Bit," which illustrates and describes the bit which is said to actually chip out the rock instead of battering the rock until it is pulverized, as does the conventional bit. The booklet contains information on type and application of bits, along with many diagrams and sketches showing dimensions and attachments. A complete specification chart is included in the publication.

16 **DRIVES**—Chain Belt Co. has released bulletin No. 51-7, "Installation, Operation and Maintenance of Chain Drives and Conveyors." The text is short and is supplemented by illustrations that show graphically the correct and incorrect ways of solving chain problems.

17 **DRYERS** — General American Transportation Corp. has released an 8-page brochure, Bulletin No. 551, illustrating and describing the Louisville drying machinery unit. Data on construction, operation and control, in addition to a photograph, are included on each type of dewatering machine.

18 **DUST RECOVERY**—Buell Engineering Co., Inc., has issued Catalog No. 101, "The Collection and Recovery of Industrial Dusts." The 28-page bulletin is divided into sections on each type of collection, with descriptions and drawings for each type.

19 **ENGINEERING**—SKF Industries, Inc. has announced that its 270-page book, "Ball and Roller Bearing Engineering," is being made generally available to engineers, product designers, maintenance men and engineering students, at the special price of $1.75 per copy. The text covers in technical detail such subjects as bearings and nomenclature, capacities, selection and design. Interested individuals in the continental United States should write to SKF Industries, Inc., Philadelphia 32, Penn.

20 **EXCAVATOR** — Koehring Co. has announced the availability of a sales catalog describing the latest advancements made on the Koehring Model 304 excavator and its attachments. The booklet contains 117 illustrations and drawings that depict the story of design, construction, work capacity and application of the heavy-duty excavator.

21 **EXCAVATORS**—Sauerman Bros., Inc., has issued Catalog 19-C describing and illustrating slackline cableway excavators. This 24-page booklet discusses conveying and excavating, supplemented by application photographs and diagrams.

22 **FANS**—Sturtevant Division, Westinghouse Electric Corp. has published a 16-page, condensed catalog, Booklet B-5164, describing equipment for air conditioning, air handling and air cleaning. General purpose and industrial fans are discussed, and specifications and capacity data are included.

23 **FEEDERS**—The Jeffrey Manufacturing Co. has released an 84-page catalog, No. 830, describing and illustrating Jeffrey-Traylor electric vibrating feeders and conveyors. Complete specifications, numerous photographs, charts and diagrams are featured in the catalog.

24 **HAMMERMILLS** — Williams Patent Crusher and Pulverizer Co., Inc., has published a 24-page catalog, Engineering Bulletin 672, covering its complete line of heavy-duty hammermills. Many photographs and diagrams are featured, along with a listing of specifications and descriptive data.

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25 LIMESTONE SPREADING — Hercules Steel Products Corp. has released Bulletin No. 8050, which gives illustrated descriptions on fast and efficient spreading of limes and fertilizers. The spreader described may also be used as a seeder.

26 MAGNETS — Dings Magnetic Separator Co. has announced the publication of a 12-page catalog, C-5000-B, briefly describing its entire line of magnetic separators and lifting magnets. The illustrated bulletin serves as a guide to the selection of a magnet from the application standpoint.

27 MANGANESE STEEL—Kensington Steel Co. has released a 12-page bulletin, No. 151, picturing and describing numerous parts subjected to abrasive shock and wear in cement mills, lime plants and quarries. These parts are made of Oro alloyed manganese steel, and the various alloys are named with applications indicated.

28 ORE HAULAGE—Cummins Engine Co., Inc. has issued a 4-page leaflet "Low Cost Ore Haulage with Cummins Diesels." The bulletin, No. 5313-Report No. 2, gives a listing of 1948 and 1949 haulage costs, in addition to operating and maintenance information.

29 PROCESS EQUIPMENT—Electric Steel Foundry Co. has published an enlarged and more comprehensive version of its original process equipment bulletin. This catalog, No. 178, describes special equipment for industries where operations are subject to corrosion, heat or abrasion. Detailed specification charts for fittings, flanges, valves, pipe and tubing are included in the 68-page catalog.

30 PUMP MOTORS — Electric Machinery Manufacturing Co. has published E-M Synchronizer No. 33 dealing with large pumps and the application of a-c motors to them. The 24-page illustrated booklet contains engineering information, charts and diagrams.

31 PUMPS — Ingersoll-Rand Co. has released Catalog 7228, describing and illustrating the Class APH-APK line of vertical, turbine-type pumps. An approximate dimension chart is included as well as a listing of I-R branches or distributors throughout the world.

32 PUMPS — Morris Machine Works has issued a bulletin, No. 183, describing the function, sizes and capacities of its centrifugal pumps. This pocket-size booklet is prepared for quick reference to factual data.

33 PYROMETERS — Minneapolis-Honeywell Regulator Co. has issued an 8-page illustrated bulletin, No. 1081, describing its new line of noncontrol pyrometers and resistance thermometers. Included are wiring diagrams and circuit information of pyrometer, resistance thermometer, tachometer and other actuations.

34 RECORDERS—The Bristol Co. has announced Bulletin OP1504, which gives information on models, ranges, specifications and uses of the company's line of running-time recorders. These recorders are furnished in models suitable for wall, flush-panel or portable use.

35 REFRACTORY CEMENT — Harbison-Walker Refractories Co. has published a 4-page bulletin, describing Vega Bond, a silica cement for use in laying Vega, Star and other silica refractories. Among the properties illustrated are comparative effects of heat treatment, refractoriness, trowelling and setting.

36 ROD MILLS—Hardinge Co. Inc. has published a 12-page catalog, Bulletin No. 25-C, describing and illustrating rod mills, with a general discussion of the correct field of application for both wet and dry grinding. Specifications include sizes, weights, rod charges, speeds, horsepower ratings and types of liners and feeders.

37 SCRAPER — LaPlant-Choate Manufacturing Co., Inc., has announced the release of a 16-page catalog, Form No. A-1285, describing the Model TS300 motor scraper, a high-speed, rubber-tired, self-propelled earthmover.

38 SCREENS—Link-Belt Co. has published a 20-page illustrated booklet, No. 2377, on Model UP vibrating screens for dry-screening of light and fine materials, and Model NRM liquid vibrating screens for separation of solids from liquids. Descriptive material includes specific information on selection, dimension tables, weights and horsepower requirements.

39 SPEED REDUCER—The Falk Corp. has published an engineering bulletin, No. 2108, describing and illustrating horizontal right angle speed reducers, which are furnished with spiral bevel precision cut helical gears, and equipped with oil pump for positive lubrication, along with anti-friction bearings. The bulletin also includes torque capacity tables, dimensions, horsepower rating tables, etc.

40 TIRES—The B. F. Goodrich Co. has published an 8-page booklet, "9 Ways to Get More Miles Out of Truck Tires." The text on each of the nine subjects is short, descriptive and illustrated. A truck tire load and inflation table and a dual spacing table are among the features.

41 TRACTOR-SHOVELS—The Frank G. Hough Co. has published a 12-page catalog, No. 217, entitled "Profitable Construction with Payloaders." Helpful job data, specifications and features of the tractor-shovel line are included, as well as illustrations of accessories such as backfiller blades, cram hooks, snow plows and fork lifts.

42 TRACTORS — Allis-Chalmers Manufacturing Co., Tractor Division, has issued two 16-page catalogs, each describing and illustrating a new crawler tractor. One discusses the Model HD-9, the other covers the Model HD-15, weighing 27,500 lb. and developing 102.0 hp. at the drawbar. The HD-9 weighs 18,500 lb. and develops 79.0 drawbar hp. Complete specifications, plus details of allied equipment and special accessories are included.

43 TRACTORS — Caterpillar Tractor Co. has issued a 40-page booklet, Form 30081, entitled "Caterpillar Products." This booklet, published annually, contains a listing with brief specifications and pictures of the current line of company products. Several application pictures show diesel tractors and motor graders in action.

44 TRUCKS—Euclid Road Machinery Co. has completed a catalog describing its line of heavy-duty dump trucks powered by General Motors Series 71 diesel engines. Described are rear and bottom dump models from 10 to 34 tons rated capacity, an 18-cu. yd. scraper and a loader. Listings of branches and distributors are included in the release.

45 TRUCKS—Federal Motor Truck Co. has released a fully illustrated bulletin, showing its line of heavy-duty motor trucks, including six-wheelers. The release has sections covering gasoline and diesel engines, special heavy-duty construction features and specifications on the complete line.

46 TRUCKS—Mack Trucks, Inc. has announced the release of an 8-page booklet, "National Security Rides on Trucks." This booklet is designed to emphasize a three-point program: high priority for the needs of our essential roads, abolition of obsolete and conflicting state road restrictions and full use of highway taxes for better highways.

47 WELDING — Alloy Rods Co. has released a brochure, Bulletin AR51-1, "Alloy Welding Electrodes for Defense Production." Complete photographs and descriptions are included in the 12-page publication.

48 WELDING — Taylor-Wharton Iron & Steel Co. has released a 6-page folder, Bulletin No. 451, dealing with Tisco timang manganese-nickel steel welding products and cast manganese steel point bars, grouser bars and repointers. The folder features photographs and sketches and a complete listing of specifications.

49 WIRE ROPE—Macwhyte Co. has issued a ropeology bulletin, No. 5134, entitled "Wire Rope—So What?" The folder contains a complete illustrated discussion highlighting the advantages of wire rope usage.

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(12-51)

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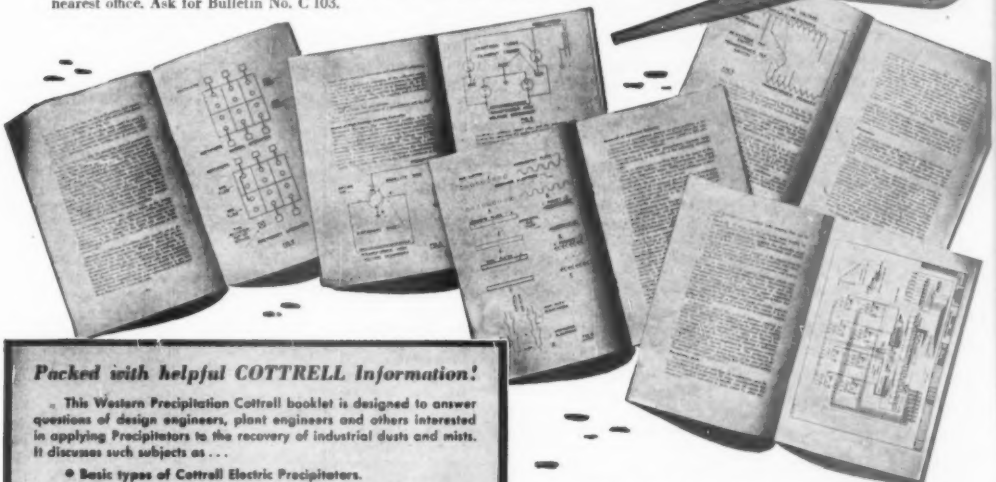
From Western Precipitation—the organization that pioneered the commercial application of Cottrell Precipitation...

IF YOU ARE ENGAGED in any phase of industry where the recovery of dusts, fumes, fly ash, mists, fogs or other suspensions from gases is a problem, you will find this booklet on the COTTRELL Electrical Precipitator helpful and informative.

Western Precipitation pioneered and installed the first commercial application of the well-known COTTRELL Electric Precipitator—Dr. Cottrell, the inventor, being a member of the company. And for more than 42 years Western Precipitation has consistently led in developing new COTTRELL advancements and techniques for recovering suspensions from gases, both wet and dry.

This 28 page booklet summarizes many of the basic facts you should know about modern COTTRELL Precipitators—the various types available, how they operate, principal types of electrode systems and rectifiers, shell constructions, etc. As long as the supply lasts, a free copy will be sent you on request to our nearest office. Ask for Bulletin No. C 103.

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This Western Precipitation Cottrell booklet is designed to answer questions of design engineers, plant engineers and others interested in applying Precipitators to the recovery of industrial dusts and mists. It discusses such subjects as...

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- **Various types of Collecting Electrodes (rod curtains, corrugated plates, dual plates, pocket electrodes, etc.).**
- **Removal of Collected Material.**
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- **Operating Efficiencies and the Effect of Various Factors on Performance.**

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Western Precipitation is not affiliated with any other company in the field of electrical precipitation except its wholly owned subsidiaries, International Precipitation Corporation and the Precipitation Company of Canada, Ltd. Whether you are now contemplating the installation of a Cottrell Electrical Precipitator, or may be interested in such an installation at a future date, we can and will serve you in any part of the United States or other countries.

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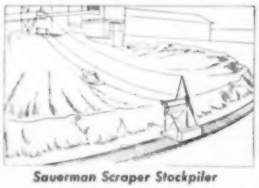
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Sauerman Scraper stores and reclaims 150,000 tons of stone on space between dock and cement mill.



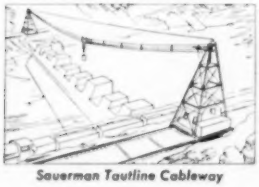
Sauerman Scraper Excavator



Sauerman Scraper Stockpiler



Sauerman Slackline Excavator



Sauerman Tautline Cableway

For more than forty years the main Sauerman business has been the designing and building of cable-operated excavators and conveyors that overcome the difficulties and reduce the costs of moving materials over large areas. Among the best known of these Sauerman machines are the following:

Drag Scraper Excavator — An economical machine for pit and hill excavation, rehandling industrial wastes, cleaning out ponds and general long range earthmoving. It is a powerful excavator and a rapid conveyor.

Drag Scraper Stockpiler — For bulk storage, Sauerman engineers have developed a series of drag scraper machines that make storing and reclaiming an easy one-man job. These machines are giving satisfaction in handling such diverse materials as coal, concrete aggregate, ore, salt, sugar, fertilizers, etc., both indoors and in the open.

Slackline Cableway Excavator — This unique machine has no equal for work that requires digging deep and far and conveying to a high delivery point. In a wet gravel pit, for instance, it reaches under water, comes up with a heaping load of gravel, and lifts its load to the top of the plant, delivering thirty to forty loads an hour.

Tautline Cableway — This is a long range aerial crane designed for all jobs of lifting, conveying and placing loads of unwieldy materials. It is used in quarries and open pit mines to lift and carry big chunks of stone and ore. It is standard equipment for contractors on concrete dam construction.

Other Sauerman Machines — Sauerman also builds Tower Excavators and Scraper-Loaders for work requiring machines that move along as they dig; also Power Rakes and Grapples for handling massive materials.

Literature — Tell us which of the above machines interests you and we will send concise, easy-to-read catalogs giving you detailed information.

SAUERMAN BROS., Inc.
530 S. Clinton St. Chicago 7, Illinois

Cableway and Scraper Specialists Since 1909

Kiln Efficiencies

(Continued from page 101)

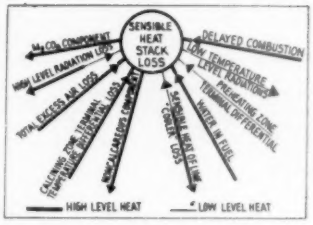


Fig. 39: Sources of stack loss of heat

Stack Loss

There would be little sensible heat passing off as stack loss in the case of high calcium lime and none in the case of dolomitic or cement kilns if it would not be for terminal differential, radiation, cooler, and excess air losses. Reduction of any of these reduces the stack temperature. Reducing the stack loss needs to be practiced at the hot end of the kiln, the further from the stack the more good one can do. The lime cooler for example is, strange as it may sound, a rather good stone preheater.

What affects the stack loss and stack temperature is portrayed in Fig. 39. The high heat level radiation loss is represented by the heavy line and arrow pointing out and a light line pointing in opposition represents its contribution of low level heat to the stack loss. The same applies in the case of the cooler loss. For example, the excess air line leads to the stack with a heavy line meaning that it is all high level heat. This sort of interpretation is applicable to the other losses.

Wins Damage Suit

U. S. Gypsum Co., Chicago, Ill., has been awarded damages of $262,450 by a Suffolk County, Mass., jury in a suit against the Mystic River Bridge Authority for an easement over the company's Charlestown plant and for the construction of a pier about 90 ft. from the company wharf.

U. S. Gypsum Co. charged that the value of its property had been lessened by the construction of the pier and the taking of the easement in the air, which is where the high-level bridge passes over a silo and other buildings. The company also contended that the bridge pier made docking of vessels at its wharf difficult and dangerous.

The defendant contends it took the land involved under the right of eminent domain and that U. S. Gypsum Co. is not entitled to other damages as the result of the building of the bridge. The Bridge Authority plans to appeal the case to the Supreme Court if the county judge allows the amount awarded.

Kentucky Stone Plants

(Continued from page 105)



The secondary crusher is a 3-ft. cone unit, scalper screen in the foreground. Reed Crushed Stone Co.

Belt conveyors are used throughout and motors are the all-weather type supplied by Fairbanks-Morse. Of rugged construction, they are mounted on substantial concrete pillars and operate without cover. The plant is of steel construction and has a normal capacity of 1200 tons per eight hours.

The first Simplicity scalper screen is mounted over a small steel bin that could be used as a truck bin. However, at the time of inspection, it was used as a surge bin and the fines in it were chuted to the belt serving the finishing screen.

In the quarry some earth stripping is done by a Caterpillar RD-8 tractor and dozer. Next, about 12 ft. of stone is drilled, blasted and removed as strippings to get to the commercial stone below. The limestone removed as strippings appears to be quite hard and tough. Primary drilling is by a Gardner-Denver wagon drill with air supplied by a "365" Gardner-Denver portable air compressor. Timken bits are used, and Atlas powder and Atlas electric delay caps are used for blasting.

Loading in the pit is done by a 1¼-cu. yd. Lorain shovel with two International rear-dump trucks hauling from the quarry to the primary crusher. The haul is about 500 ft. over easy grades.

At present all material is trucked from the plant, but the Illinois Central railway is about half a mile away and car loading facilities may be installed there later. All material sold is weighed on a Winslow truck scale.

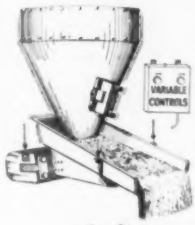
Seek Dredging Permits

ERIE SAND & GRAVEL CO., Erie, Penn., and Schwartz Sand & Gravel Co., Cleveland, Ohio, have applied to the office of the district engineer, Buffalo, N. Y., for approval of plans to dredge sand and gravel for commercial purposes in Lake Erie off Fairport.

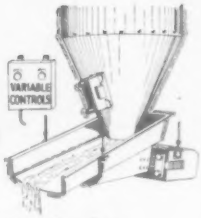
SYNTRON

"Vibra-Flow"

VIBRATORY FEEDERS



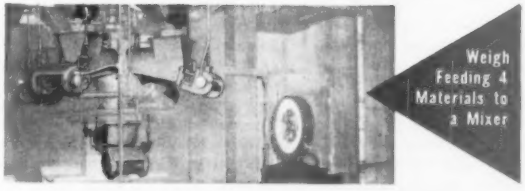
Provide Instant Control from A Gushing Torrent to A Trickling Dribble

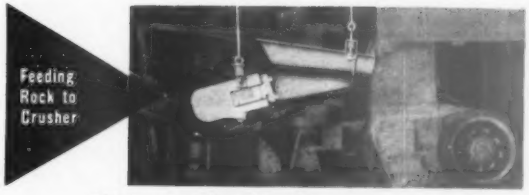


—feeding most all types of bulk materials—fine, lumpy, abrasive—hot or cold—dry or damp—at variably controlled rates, from pounds to hundreds of tons per hour. To mixers, blenders, belts, crushers, screens, ovens, driers, packaging machines, etc. With exceptionally low maintenance costs due to absence of motors, pulleys, gears, cams, sprockets, chains and other wearing parts.

Flat pan and tubular feeders, screening and grizzly feeders, picking tables—and a host of other types available.



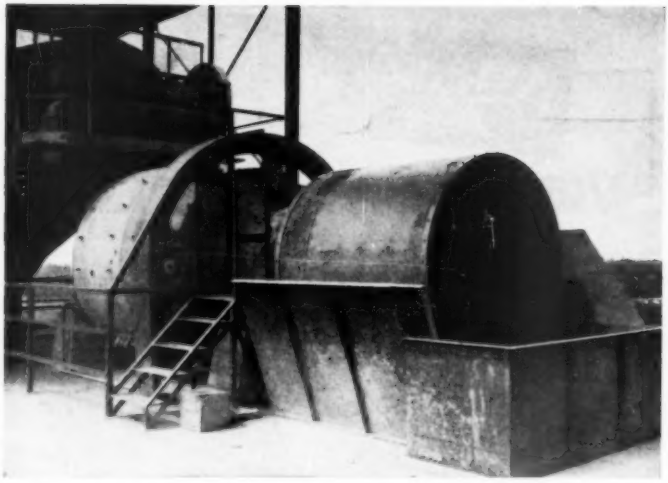




Write for Catalog Data

SYNTRON COMPANY

450 Lexington Avenue Homer City, Penna.



Hardinge 8' x 48" Scrubber with 6' x 6' screen, removing clay from 60 to 80 tons per hour of minus 1½" material.

HARDINGE SCRUBBER KEEPS QUARRY FROM BEING ABANDONED

A west coast sand and gravel firm was faced with a quarry shut-down due to exhaustion of their high-grade deposit. Below the 12' level, extensive deposits of the excellent sand and gravel were present, but unfortunately clay strata ran through this entire lower section.

The problem then, in order to continue operation, was to find a suitable washing device to eliminate the clay, which when wet is very sticky and difficult to wash and process.

The solution was found in a Hardinge Conical Scrubber. The scrubber consists of a conical shell like that of the well-known Hardinge Conical Mill, discharging into a cylindrical dewatering screen which is fastened to the discharge end of the scrubber and rotates with it. Internal liners and special lifting flights create a turbulent "mass action" which is similar to the effect obtained by rubbing a handful of pebbles together between the palms in a bucket of water. The Hardinge Scrubber installed was an 8' diameter x 48" cylinder unit with a 6' x 6' dewatering screen.

About 30% to 33% of the total raw material entering the entire plant passes through the Hardinge Scrubber. Usual water requirements for a scrubber of this type are 2.5 to 3.0 G.P.M. per ton per hour of feed. Now in full operation, the Hardinge unit has fulfilled expectations in regard to quality of output, simplicity of operation, tonnage handled, mechanical aspects and its overall economy of operation. The sand and gravel as now processed in the new washing plant is making an excellent product, one that meets every federal, state and local specification.

HARDINGE
COMPANY, INCORPORATED
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NEW YORK 17 • SAN FRANCISCO 11 • CHICAGO 6 • HIBBING, MINN. • TORONTO 1
122 E. 42nd St. 24 California St. 205 W. Wacker Dr. 2016 First Ave. 200 Bay St.



Industrial Sand Meeting

(Continued from page 115)

and that is not the total. Our policy is to be one of increasing boldness in international affairs even at the risk of all-out war.

A United States of Western Europe is badly needed, he said, to overcome an impossible situation as it now exists. The British Empire is nearing disintegration and there is nothing to stop it.

The future will be difficult, said Mr. Ahearn. We must have an army of at least 3,500,000 men and the outlook is for more taxes. A new tax bill for 1953 is expected. In 1945 during the peak of World War II we were spending $95 billion and had a national income of $50 billion. We will spend $88 billion for the fiscal year 1952 and have a national income of $81 billion.

Wage and price controls are expected to prevail for a long time and little change is expected and that hope rests only in Congress. Coal strikes are expected to add to the difficulties. The nation has no protection against major strikes and the force of public opinion is the only thing we have to settle strikes but John L. Lewis has already shown his indifference to that. It is expected that strikes in the steel industry may also cripple the nation.

The split between the C.I.O. and A.F.L. is considered a fortunate development because, when working together, they constitute a powerful political organization. This split is expected to benefit the Republican chances of election and, it is believed, probably was a factor in Senator Taft's re-election in Ohio. This is likely a worry to the Truman administration.

Mr. Ahearn cautiously predicted that President Truman will not run for re-election in spite of great pressure upon him as the most powerful Democratic candidate. People have short memories and soon forget mistakes, he said. Vice-President Barkley, Judge Vinson and defense secretary Lovett were mentioned, among others, as possible Democratic candidates.

Among the Republicans, Senator Taft is most likely to be nominated for the presidency. General Eisenhower is looked upon as an amateur politician and there seems little chance for either Stassen or Dewey. The prediction was that the election could well shape up as a contest between Judge Vinson and Senator Taft.

Communism, Acheson, spending and corruption will be the main Republican issues in the 1952 campaign. The budding Taft-Dewey "intramural" issue might menace chances for Republican success.

Mr. Ahearn does not believe a third world war will come in the immediate future, although there is always a possibility of being pitched headlong into war. The Russians believe it unnecessary, to destroy the United

States, to achieve their objectives. Excess population and dwindling resources throughout the world are considered a greater menace than Russia. In conclusion, Mr. Ahearn suggested that it would be the wise thing for people to keep their sense of humor.

N.P.A. Issues Amendment to Order M-78

N.P.A. ORDER M-78 which establishes procedures for the mining industry (replacing CMP-Reg. 5) in obtaining MRO items and minor capital additions and which also provides for the submission of applications to the Defense Minerals Administration for obtaining priority assistance for major capital additions, has now been amended. The order, as amended, includes the following provisions:

Section 1 refers to the allotment symbol (H-6) and the rating (DO-H-6) which may be used to obtain limited quantities of controlled materials and products and materials other than controlled materials for MRO and capital additions.

Section 2 deals with definitions of words and terms used throughout the order. It has been amended to read as follows: "Maintenance" means the minimum upkeep necessary to continue any plant, facility or equipment in sound working condition, and "repair" means the restoration of any plant, facility, or equipment to sound working condition when it has been rendered unsafe or unfit for service by wear and tear, damage, failure of parts, or the like. Neither "maintenance" nor "repair" includes the replacement or the improvement of any plant, facility or equipment by replacing material which is still in sound working condition with materials of a new or different kind, quality or design.

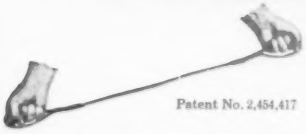
Section 3 explains the use of the new ratings. Subject to quota limitations and other restrictions of the order, every producer has the right to use the allotment symbol "H-6" on delivery orders for controlled materials for MRO and minor capital additions, but use of this symbol does not constitute the making of an allotment. Also, the allotment symbol may be used to acquire only that amount of controlled material actually needed in the company's operations.

Section 4 gives the right to use the rating "DO-H-6" to obtain MRO items and minor capital additions which do not require controlled materials. Again, this rating may be used only for materials needed in the company's operations.

Section 6 deals with materials for which the allotment symbol and DO rating may not be applied or extended. They may not be used to obtain any of the materials listed in Schedule I of CMP Reg. 5. There are no exceptions. The ratings may not be applied by a producer to obtain in any quarter (calendar or fiscal) materials for

MAKE THIS TEST YOURSELF...WITH A FREE Tuffy SLING





Patent No. 2,454,417

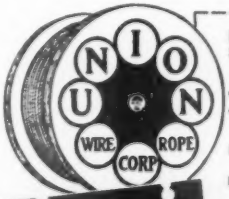
Tie a knot in a Tuffy Sling, then pull it tight with both hands and feet. See how flexible it is — and how it straightens out without damage. The secret is in the braided fabric construction — a patented Tuffy feature!

Scores of wires are stranded into 9 parts, then machine woven into an interlaced wire fabric entirely unlike conventional wire rope slings. Even cutting one of the 9 parts does not result in stranding. And eye splices develop up to 95% of the fabric strength.



11 Types of Tuffy Slings If none of the 11 factory packaged Tuffy Sling types exactly meet your needs, Union Wire Rope engineers will develop one that does. Tuffy Slings are proof-tested to twice safe working load. The safe working load is stamped on a metal band attached to each sling. If you have your own rigging loft, Tuffy braided fabric is available by the reel.

MAIL COUPON TODAY FOR YOUR FREE SLING
This special 3-foot sample is yours without cost so that you can prove to yourself the advantages of a Tuffy Sling. Just mail the coupon.



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minor capital additions exceeding 10 percent of his quarterly MRO quota, or $2000, whichever is greater.

Section 6 (c) has been amended to read as follows: The allotment symbol H-6 to procure rails, and the DO-H-6 to procure track accessories, may not be used by any producer to obtain such items in an amount to exceed the ratio of consumption by weight of these items to his production by weight for the average of the years 1948, 1949 and 1950. The ratio shall be separately calculated for (1) rails and (2) track accessories. (The use of M-78 ratings to obtain chemicals has been eliminated as most chemicals are now under N.P.A. allocation.)

Section 7 covers computation of the quarterly MRO quota. All expenditures in the base period for MRO, except materials listed in List A of N.P.A.-Reg. 2, are included. The base period is the calendar year 1950, or if a producer operated on a fiscal year basis prior to March 1, 1951, he may elect to take as his base period his last fiscal year ending prior to that date. Once such an election is made, it cannot be changed without the prior written approval of D.M.A.

The quarterly quota is one-fourth of 120 percent of the quota base, or a seasonal quota may be established if desired. Such seasonal quota for any quarter shall be 120 percent of the expenditures by the producer for MRO (except materials listed in List A of N.P.A.-Reg. 2) in the corresponding quarter of the base period.

Section 7 (f) explains how a producer who was not in operation throughout the base period should establish his quota. Producers not in operation during the base period may establish a quota up to $10,000 without prior D.M.A. approval.

Section 8 concerns charges against a quota. A choice is given between a quota based on purchase orders which specify delivery, or a quota based on actual receipt of materials. Once a choice is made, it cannot be changed without D.M.A. approval. All MRO items, whether or not obtained by the allotment symbol or the rating, except materials listed in List A, of N.P.A.-Reg. 2, must be charged against the quota. Expenditures for minor capital additions are charged against the quota only if obtained by use of the allotment symbol or rating.

MRO items and minor capital additions not exceeding $10,000 may be ordered (or received) without regard to quota limitations. If the allotment symbol or the rating for more than 20 percent of the quota in any quarter are not used, other MRO items and minor capital additions may be obtained without regard to quota limitations.

Section 13 deals with applications for increasing the MRO quota. Such applications should be submitted on D.M.A. form MF-400.

Section 14 covers the necessary certification on purchase orders for MRO and minor capital additions. Where

controlled materials are involved, there must be an abbreviated designation of the calendar quarter and the year for which the quota is valid. For example, "H-6 4Q 51," indicates the allotment symbol for controlled materials, valid for the fourth quarter of 1951. Each delivery order shall bear the certification "Certified under N.P.A. Order M-78." A producer placing a delivery order for products or materials other than controlled materials for MRO or minor capital additions shall indicate on each delivery order the rating and allotment symbol DO-H-6 together with the words "Certified under N.P.A. Order M-78."

Section 15 covers procedures for obtaining rating assistance on major capital additions. Applications should be made by letter, giving the following information:

1. Mine serial number issued under Mining Order 7.
2. Description of machinery and equipment required.
3. Manufacturer or supplier, model, purchase order number (if any), required delivery date and approximate dollar value.
4. Need for machinery or equipment and expected results.

Producers who have not been assigned a mine serial number should add the following information:

5. Description of property (location, pertinent facts regarding ore body).
6. Production in 1950 and current rate of production.

Failure to include all the information requested above will result in unnecessary loss of time, making rating assistance impossible until the required data are presented.

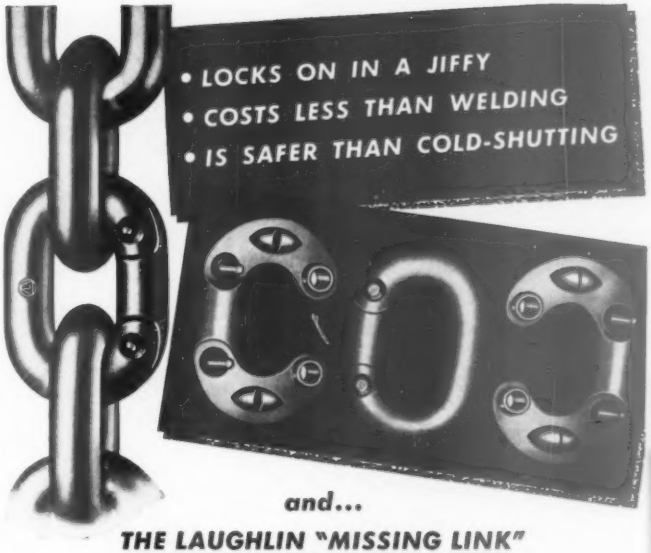
Other sections of the order deal with status of orders rated DO-48; obligation to supply MRO under lease or other agreement; use of materials; restrictions on receipts and inventories; supplier receiving improperly rated orders; application by foreign producers; records and reports; communications; and violations.

Letters to D.M.A. on increases in MRO quotas and for rating assistance for major capital additions should be addressed to George H. Roll, Requirements Division, Defense Minerals Administration, Room 4265 New Interior Building, Washington 25, D. C.

N.L.R.B. Decision

NATIONAL LABOR RELATIONS BOARD recently ruled that an employer may lawfully forbid distribution of union literature in his plant, providing he does not discriminate between unions and if he does not intend to suppress his employes' organization activities.

The unanimous decision was given in a case involving Monolith Portland Cement Co., Monolith, Calif., and two unions. The issue of a ban on union literature stemmed from the firm's removal of one notice from a union bulletin board and a ban it imposed on distribution of union literature in the plant itself.



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THE LAUGHLIN "MISSING LINK"
WITH INTERLOCKING SAFETY LUGS

Makes Your Chain Stronger Than Ever!

To attach a "Missing Link" you simply insert the halves through the links to be joined, fit the rivets into the rivet holes, then peen the rivets to fill the countersunk holes. And once on, the pressure-matched *interlocking lugs* take all the load — with no strain on the rivets.

Add the fact that drop-forged, heat-treated "Missing Links" are *made* stronger than proof coil chain to begin with, and you'll see why these time- and money-saving repair links give you a stronger, safer chain than you ever had before! . . . Laughlin "Missing Links" are available in all sizes from 3/16" to 1⅛" at your mine, mill or oil field supply house.

Free! *Catalog-Data Book*
Tells you how to select the *right* wire rope and chain fitting for every job. Complete specifications—helpful tables. Use the coupon below.



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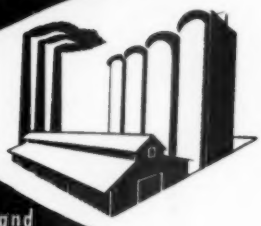
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THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



going into winter production of special cements?



If your past year's Type I business is slacking off . . . and you're grinding High Early Strength, Type 2, and other special cements

Consider **TDA** the accepted grinding aid,

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TDA increases HES cement grinding rates 25 to 50%.

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TDA works well not only with all types of portland cement, but also with puzzolanic and natural cements. Its cost is amortized as you use it.

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Pulverizers

Have you investigated our new BRADLEY HERCULES MILL? Unquestionably the last word in Economy and Simplicity.

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ALLENTOWN, PENNA.

Cement Shortage Growing?

THE ACUTE CEMENT SHORTAGE continues serious in many sections of the United States and recent reports indicate the Columbus, Ohio, area to be particularly hard hit. New runways at Lockbourne Air Base consume much of the cement supply in that area. Government projects and new highways also are using considerable quantities of cement with the result that builders and individuals cannot obtain adequate cement for home building. Construction companies and concrete firms are said to be receiving only one-third to one-half of their normal amount of cement.

An official of a ready-mixed concrete company predicts that the shortage will continue for at least ten years unless new producers enter the field, and that the Lockbourne situation is only a local evidence of a national trend toward increased use of cement. "We're only getting one-third of what we should have"—"The situation is really getting tough"—"We haven't been taking orders from individuals because we don't know when we can fill them and it's really hurting our business"—these are typical comments given by other concrete producers regarding the situation.

Perlite Convention

THE PERLITE INSTITUTE held its second annual convention in New York City at the Park Sheraton hotel, October 11-12, 1951. The institute members had double cause for celebration —the receiving of the Grand Award for distinguished service awarded annually to a trade association for outstanding accomplishment in behalf of its industry, and the acquisition of five new members to the institute, making a total of 45 members.

Due to the rapid growth and advance of the institute, a field engineer, a publicity and advertising manager and a technical secretary have been added to the staff.

Several fire and sound transmission tests are on the institute's program for 1952, as well as research at five independent laboratories.

The board of directors consists of J. John Brouk, president; Kirk E. Hazelton, vice-president; Donald H. Gott, Lewis Lloyd and J. C. Kingsbury. Wharton Clay was re-elected secretary-treasurer.

The convention program included a discussion by Stuart P. Wilson, Washington field engineer of the Perlite Institute, on the details of government and civilian building construction and the procedure for getting orders; an address by C. O. Christiansen, chief of the Property Requirements Section, F.H.A., on the position of perlite in F.H.A., and the information required by F.H.A. to extend the uses of perlite to exterior stucco, panel walls, hollow wall fill, concrete roofs, etc.; and presentation of the Honor Award.

There was also discussion by Mr.

Brosseau, Perlite Industries Engineering, Montreal, Canada, on mix ratios and procedure, curing economies, etc., on the company's perlite and ground limestone and concrete block operations; an address by C. M. Timpe, technical supervisor, The Barrett Division, Allied Chemical and Dye Corp., New York City, on "Technical Problems in the Application of Built-Up Roofing;" an address by K. R. Woods, Underwriters' Laboratories, Inc., Chicago, Ill., who discussed the advantages of the U. L. inspection service and its relation to the perlite industry.

A panel discussion on perlite plaster problems was led by Harry E. Lewis, chairman of the technical committee on plaster, Palmer G. Craig, The Cleveland Gypsum Co., and Fred Shifty, New York City plastering contractor. The program also included a preliminary report by Donald R. Tellefsen, chairman of the health hazards committee, on the study being undertaken by the Trudeau Foundation; a report by T. C. Ward, Jr., chairman for the publicity committee, on the meeting of his committee and its plans for 1952; a report by W. P. Tuller, chairman of the traffic committee, on traffic problems; and a report by Thomas H. Coulter, chairman of the technical committee on concrete, on the concrete tests supervised by Robert W. Hunt Co., engineers.

Changes Name

PENNSYLVANIA-DIXIE CEMENT CORP., New York, N. Y., has announced the change of its corporate title to Penn-Dixie Cement Corp.

Australian Cement

AUSTRALIAN CEMENT PRODUCERS are extending their plant facilities to increase annual cement production by about 20 percent. Present annual output totals approximately 1,250,000 tons, which is inadequate to meet Australia's big development and housing programs. The increased production is expected to reduce considerably the cost of construction in Australia since imported cement costs two to three times as much as domestic supplies.

Venezuelan Cement Loan

C. A. VENEZOLANA DE CEMENTOS was recently granted a $4,000,000 loan by the U. S. Export-Import Bank, for a part of the company's $12,000,000 expansion program at its Pertigalete plant near Barcelona.

The additional cement produced is to be used in the expansion of petroleum production, iron ore development, other defense projects, highways and public works.

The credit authorized by the Export-Import Bank will be guaranteed by a financial agency of the Venezuelan government and will bear interest at the rate of 4½ percent. The loan is to be repaid in ten semi-annual installments, beginning in 1954.

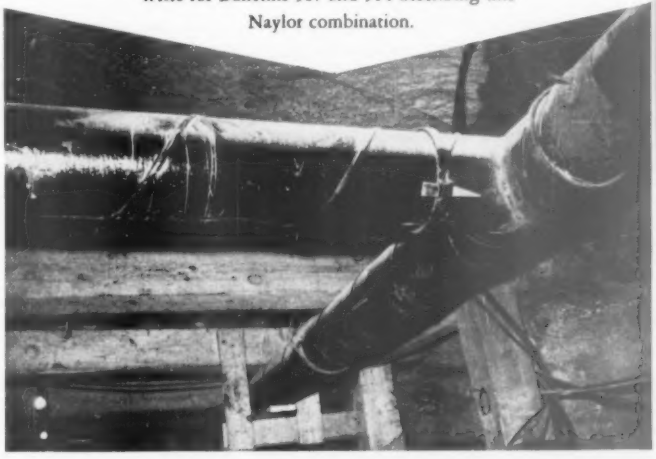


HOW TO PROVIDE
FRESH AIR For Underground Operations

Mining engineers have found the practical answer in the combination of Naylor Pipe and Naylor Wedge-Lock Couplings.

Air lines can be installed quickly with this dependable lightweight pipe and these one-piece, positive-type couplings that provide the fastest possible connections, even in limited space. Though light in weight, Naylor Pipe has the extra collapse strength, due to its exclusive Lockseam Spiralweld structure, to do double duty in push-pull ventilating service. Thus Naylor lines supply fresh air as well as exhaust dangerous fumes.

Write for Bulletins 507 and 514 describing this Naylor combination.



NAYLOR PIPE

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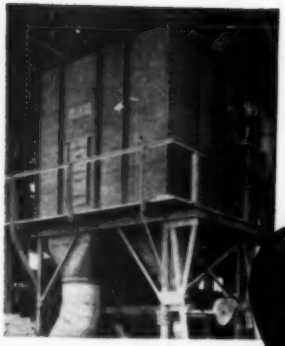


Illustration above shows a Sly Dust Filter in the pack house of a cement plant. Several dust pipes enter the fan side of the filter. The exhaust fan is located on the floor below filter. A screw conveyor automatically and continuously removes the collected cement.

Pioneers and Leaders
in **DUST CONTROL**

You, too, Can Benefit by
SLY GREATER COLLECTING EFFICIENCY

This is a typical Sly installation. Literally, hundreds of similar installations are in use in connection with production of cement, crushed stone, agricultural limestone, gypsum, asbestos, talc, feldspar, fluorspar, gold, copper and iron ore, diatomaceous earth, bauxite, etc.

Sly Dust Filters collect dust generated in such operations as crushing, grinding, screening, conveying, loading, separating, and mixing — Saving valuable materials, adding to net income.

Sly Filters are saving money for their users by providing cleaner plants, better working conditions, greater production, less cleaning up (interiors, roofs, surroundings, etc.), and cleaner products, which sell better. Thousands of installations.

NOT EXPENSIVE — SLY FILTERS SOON PAY FOR THEMSELVES

Sly Dust Filters get all the dust by filtration through cloth. They offer you:

1. **Greater filtering capacity because of more filtering cloth.**
2. **Taut bags (patented) save power and improve dust removal.**
3. **Bags more easily replaced.**
4. **Automatic control (any degree) minimizes or entirely removes the human factor.**
5. **Simpler shaker mechanism results in savings in maintenance and operation.**

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JANUARY IS THE ANNUAL REVIEW AND OUTLOOK ISSUE

Research Laboratory

ZONOLITE CO., Chicago, Ill., has announced plans for the establishment of a research laboratory in Evanston, Ill., according to Dr. George E. Ziegler, research director for Zonolite Co.

Dr. Ziegler will direct the work of the new laboratory where a comprehensive program of basic and applied research in vermiculite and vermiculite products will be conducted. He will also coordinate test and research projects now in progress for the company at other laboratories. These programs are being carried on at Underwriters Laboratories; Armour Research Foundation; Robert W. Hunt Co., Chicago, Ill.; Midwest Research Institute, Kansas City, Mo.; Riverbank Laboratories, Geneva, Ill.; and Pittsburgh Testing Laboratory, Pittsburgh, Penn.

Big Missouri Road Program

A JOINT COMMISSION of the Missouri Senate and House has proposed a 10-year road-building program to cost a total of $557,500,000. The proposed program would be financed by a one cent increase in the state's gasoline tax, a tax on fuels other than gasoline, increases in bus and truck license fees, and a higher trailer tax and proceeds from a use-tax enacted last spring. This would still leave the over-all road fund an estimated $13,000,000 short, but committee members felt that this additional sum would be provided by the normal increase in travel and number of vehicles subject to license.

Agricultural Phosphate

THOMSON LIME CO., Mansfield, Mo., recently announced the installation of facilities to supply local requirements of rock phosphate for soil improvement programs. A bulk plant with a 200-ton storage capacity is being installed, and equipment for spreading the phosphate is being added.

Leases Quarry Equipment

THE LOUISVILLE, KY., fiscal court has leased equipment of the inactive county quarry to W. T. Liter who operates quarries on Blankenbaker Lane and Blue Lick Road. Terms of the lease include $2000 annual rent and the sale of crushed stone to the county at a price one-fifth less than the Louisville market price.

To Sell Stock

MARQUETTE CEMENT MANUFACTURING CO., Chicago, Ill., is making its first public distribution of common stock, according to a registration statement recently filed with the Securities and Exchange Commission. The proposed financing consists of 100,000 shares of stock, of which 50,000 shares are to be sold by the company and the remainder by certain stockholders.

FINANCIAL

GIANT PORTLAND CEMENT CO., Philadelphia, Penn., for the year ended June 30, has given the following statement of income:

	1951	1950
Net sales	$ 5,524,291	$ 5,107,585
Net before taxes	1,545,643	1,232,272
Income taxes	822,402	525,894
Net income	723,241	706,378
Earnings per share	$0.65	$0.82
No. of shares	1,112,475	862,874

PENNSYLVANIA GLASS SAND CORP., Lewistown, Penn., has reported its account of income for the six months ended June 30, as follows:

	1951	1950
Net before taxes	$ 1,523,336	$ 1,131,127
Income taxes	840,873	440,752
Net profit	682,463	690,385
Earn., preferred share	$22.01	$22.27
Earn., common share	0.94	1.90
No. of preferred shares	31,000	31,000
No. of common shares	643,720	321,860

CALIFORNIA PORTLAND CEMENT CO., Los Angeles, Calif., has reported the following income account for the year ended April 30:

	1951	1950
Operating profit	$ 9,236,388	$ 6,556,030
Deprec. and deplet.	637,072	521,605
Federal income tax	4,575,000	2,208,848
Net income	4,024,316	2,825,577
Previous earn. surp.	10,136,479	7,958,618
Dividends	1,472,029	1,650,000
Tfr. to capital stock	4,663,000	
Debit	458,398	
Credit		2,284
Earn. surp., 4-30	7,567,368	10,136,479
Earned per share	$8.33	$76.51
No. of shares	483,150	50,000

BLUE DIAMOND CORP., Los Angeles, Calif., for the six months ended June 30, has reported its account of income as follows:

	1951	1950
Net sales	$ 7,691,900	$ 6,110,476
Cost and deliv. expenses	5,952,296	4,612,456
Selling, etc., expenses	413,389	380,902
Net earnings	1,326,215	1,117,118
Other income	9,004	1,492
Total income	1,335,219	1,118,610
Interest	4,193	5,676
Federal income tax	622,000	423,000
Excess profits tax	152,000	
Net profit	557,026	689,934
Earn. surplus, 1-1	4,092,890	3,476,793
Dividends	218,794	218,793
Earn. surplus, 6-30	4,431,122	3,947,936
Earned per share	$0.76	$0.95
No. of shares	729,313	729,313

ALPHA PORTLAND CEMENT CO., Easton, Penn., for the 12 months ended June 30, reports the following statement of income:

	1951	1950
Net sales	$24,052,590	$20,281,630
Federal income taxes	3,221,009	1,955,2[illegible]0
Federal exc. profits tax	566,140	
Net income	3,528,[illegible]47	3,128,552
Common share earn.	$6.01	$5.31

NATIONAL GYPSUM CO., Buffalo, N. Y., has reported income for the six months ended June 30, as follows:

	1951	1950
Net sales	$45,503,007	$33,905,314
Net before taxes	10,011,518	7,253,484
Federal income taxes	4,760,000	2,794,000
Excess profits taxes	1,305,000	
Net profit	3,946,518	4,459,484
Earned common share	$1.71	$2.01
No. common shares	2,180,988	2,112,336

CALAVERAS CEMENT CO., San Francisco, Calif., reported gross sales of $1,544,820 for the quarter ended June 30, 1951, compared with $1,585,550 for the same quarter in 1950. This brings first half sales totals to $2,896,890 for 1951, as against $2,538,946 for the same six months in 1950.

GENERAL

Model 420 gives you more for your money than any other 1 cu. yd. machine built



For your own satisfaction, before you buy, compare any other 1 cu. yd. shovel with a General Model 420 like this one speeding output at Mayville White Lime Works, Mayville, Wis. Check the features . . . instant, velvet-smooth Air Control of hoist, swing, steering, swing brake, crowd, retract, and dipper trip . . . patented Air Cushion Clutches that automatically compensate for gradual wear on clutch linings . . . Independent Travel with two speeds forward, two reverse . . . Independent Boomhoist . . . rugged outside dipper handles . . . powerful Diesel or gasoline engine . . . quick conversion to dragline, crane, clamshell, or hoe . . . and many other advantages. Then ask yourself which machine gives you more for your money.

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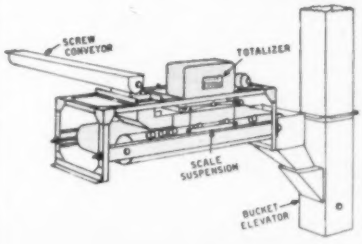
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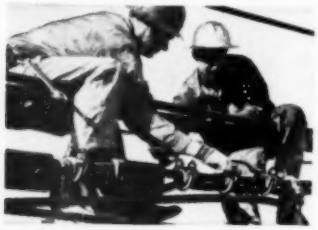


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SIZES FOR ALL WIRE ROPE
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MANUFACTURERS NEWS

Coffing Hoist Co., Danville, Ill., has announced the election of J. R. Coffing as vice-president in charge of sales, advertising and general office administration. Mr. Coffing became associated with the company at the age of 12 when he started as clean-up boy. He worked his way up through the various departments of production and administration to become general sales manager prior to World War II. Following 2½ years' service in the South Pacific with the U. S. Army Corps of Engineers, he resumed his position as general sales manager. Mr. Coffing attended the University of Alabama, and is a member of the research and survey committee of the American Supply & Machinery Manufacturers Association.



J. R. Coffing

General Motors Corp., Detroit, Mich., has announced a $1,000,000 building expansion program to increase production facilities of the firm's Detroit Diesel Engine division. According to W. T. Crowe, general manager, this is the eighth major expansion the division has made and adds almost 80,000 sq. ft. to the 1,000,000 sq. ft. now under cover.

Wheelco Instrument Co., Chicago, Ill., announces that the Western division sales office has been moved to larger offices at 2320 Milwaukee Ave., Chicago. Company activities other than sales and service will be continued at the plant located at Harrison and Peoria Sts., Chicago.

Hyster Co., Portland, Ore., has announced the promotion of two men in the company's parts and service department. Allen G. Owen has been made Western division service manager, whose territory will include all of the U. S. and Canada west of the Rockies, as well as Alaska. James Leep, parts order clerk, has been advanced to the position of manager of the parts order department.

St. Regis Paper Co., New York, N. Y., has announced that James H. McMillen has been appointed Western district sales manager of the multiwall bag sales division, which includes California, Washington, Oregon, Arizona, New Mexico and Nevada. His headquarters will be in Los Angeles.

Borg-Warner Corp., Chicago, Ill., has announced that James H. Ingersoll, assistant to the president of the Ingersoll products division, has been elected vice-president of that division. Mr. Ingersoll started with the company in 1937, working on factory jobs during the summers between school years.

U. S. Rubber Co., New York, N. Y., has named H. Gordon Smith, vice-president and general manager of the textile division, to the newly created post of executive vice-president of the company. William E. Clark, formerly assistant general manager of the textile division, has been elected a vice-president and made general manager of the division.

Westinghouse Electric Corp., Pittsburgh, Penn., has announced formation of a wholly owned subsidiary, the Canadian Westinghouse Supply Co., to distribute products of the Canadian Westinghouse Co., Ltd. Roy L. Brown has been appointed executive vice-president and general manager of the new firm. He was formerly Eastern district manager of the Westinghouse Electric Supply Co. in New York.

A. B. Farquhar Co., York, Penn., has announced the appointment of R. F. Tomlinson as general sales manager for all divisions, including farm machinery, conveyors, hydraulic presses, and special machinery. He has been associated with the Farquhar Co. since 1931 when the company acquired the Portable Machinery Co., for which Mr. Tomlinson was Midwestern branch manager. He remained in this position until 1947, when he was appointed sales manager of the conveyor division. W. D. Goad, who

10 TONS PER HOUR OF PERLITE ORE.....SIZED THROUGH A 4-DECK SWECO SEPARATOR



That's the story of the SWECO Separator installed at Napa Perlite, St. Helena, California. It was chosen for the accurate sizing of perlite ore after exhaustive tests. Through months of service the SWECO Separator has proven itself in this installation by continuously dependable performance in sizing at a rate considerably above the capacity of any other known screen device of comparable screen area. Write for complete details of the SWECO Separator; it can help solve your screening problems.

SWECO

The **SWECO SEPARATOR**

Division of **SOUTHWESTERN ENGINEERING COMPANY**
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has been with the company since 1936 and has been assistant sales manager of the division for the past four years, has succeeded Mr. Tomlinson as sales manager. C. W. King, formerly sales correspondent for the division, has been appointed assistant sales manager.

Wall Colmonoy Corp., Detroit, Mich., has opened a new office and warehouse in Houston, Texas, with Henry L. Howard as manager.

American Wheelabrator & Equipment Corp., Mishawaka, Ind., has announced the following personnel changes and additions: L. L. Andrus, formerly vice-president in charge of sales, has been promoted to vice-president and executive head of the dust and fume division; John A. Silver has been appointed director of sales; E. B. Rich, Chicago representative, has been named general sales manager; A. E. Lenhard, advertising and sales promotion manager, assumes new responsibilities; S. S. Deputy, sales manager, will work closely with the general sales manager on special assignments; Bernard Lester will continue as a sales management consultant to the sales division and to general management.

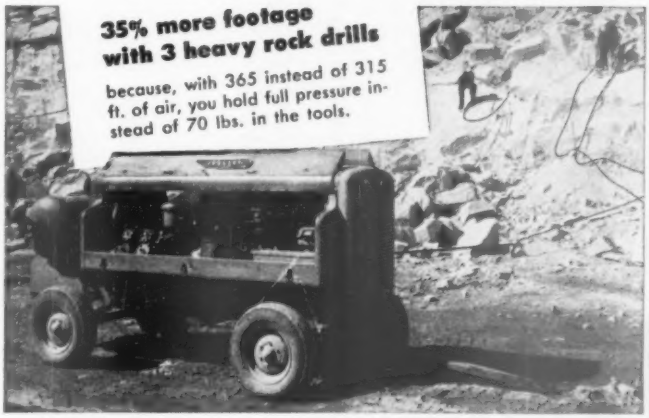
The White Motor Co., Cleveland, Ohio, has announced the election of William G. Sternberg as vice-president in charge of the Sterling division, with headquarters at Milwaukee, Wis. Mr. Sternberg has been president of Sterling Motor Truck Co., which firm has been acquired by White Motor Co. and which will be operated as a division of the company. Ernest R. Sternberg has been named general manager and J. P. Dragin has been appointed vice-president in charge of finance of the Sterling division.

Reeves Pulley Co., Columbus, Ind., announces the establishment of an assembly plant, together with sales and engineering offices, in San Francisco, Calif., and the opening of a sales and engineering office in Los Angeles. R. G. Sullivan, who has been active in West Coast engineering and manufacturing for several years, has been placed in charge of operations.

General Electric Co., Schenectady, N. Y., has appointed Raymond E. Zook as manager of labor relations for the small apparatus divisions, with headquarters at Lynn, Mass. He was formerly assistant to the manager of labor relations of the apparatus department in Schenectady, N. Y. William V. O'Brien, a commercial vice-president of the company, has been appointed manager of the apparatus marketing division. He succeeds Chester H. Lang, vice-president, who now heads the firm's public relations organization, with headquarters in New York, N. Y. Dr. Louis T. Rader has been named manager of engineering of the control divisions at Schenectady. Harry L. Palmer has been appointed assistant to Dr. Rader, and Benjamin Cooper has been appointed division engineer of the electronics and regulator engineering division.

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4 days' work in 3



75 ft.
125 ft.
185 ft.
250 ft.
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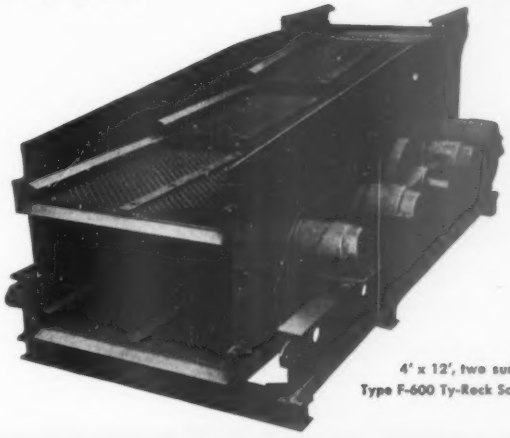
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Gloucester - Massachusetts

Westinghouse Electric Corp., Pittsburgh, Penn., has a new plant under construction in Union City, Ind., for the production of electric motors. Ralph E. Davis, plant superintendent at Bellefontaine since 1948, has been appointed superintendent of the new plant.

Nordberg Mfg. Co., Milwaukee, Wis., announces that Howard M. Zoerb has been appointed administrative manager and Ad. Hesse has been named divisional chief engineer of the crusher and process machinery divisions. Jack B. Bond has been named sales manager of these divisions, and Harold N. Propp has succeeded Mr. Bond as district manager of the Central territory. Ewald Werner has been named research and development engineer of the crusher division, and Stanley L. Apolant, of the process machinery division, has been appointed research and development engineer in that division, with headquarters in the New York office. E. F. Zillman has been made coordinator of crusher and process machinery sales, and W. J. Brenneman, Henry Behr and John Kobel have been appointed sales engineers. Mr. Brenneman has been assigned to the branch office in Toronto, Canada, and Mr. Behr and Mr. Kobel will make their headquarters in New York.



Howard M. Zoerb



Jack B. Bond

Straub Mfg. Co., Inc., Oakland, Calif., has appointed Construction Equipment Co., Spokane, Wash., as eastern Washington representative of Kue-Ken crushers.

The Refractories Institute has been formed by members of the refractory industry for the purpose of promoting demand for the products of the industry, and to spur additional research to improve products and processes. About 40 corporations representing the major portion of the industry have joined the new association. James L. Crawford of Walsh Refractories Corp., St. Louis, Mo., has been elected president, and W. A. Turner of the McLain Fire Brick Co., Pittsburgh, Penn., has been named treasurer.

The B. F. Goodrich Co., Akron, Ohio, announces that Ira G. Needles, vice-president of The B. F. Goodrich Rubber Co. of Canada Ltd., Kitchener, Ontario, has been elected company president. He succeeds George W. Sawin, who has resigned for reasons of health. Mr. Needles joined the parent company in 1916 and in 1925 became a member of the Canadian organization. He was assistant sales manager of the tire division until 1930 when he was made general tire sales manager. He has been vice-president of sales since 1945. Edgar T. Gregory has been named manager of flat belting sales, succeeding A. Clarke Mack, who has resigned. He was formerly operating manager of the industrial products sales department and will be succeeded in this position by Donald E. Schlemmer, who has been a senior sales development man for the last several years.

Link-Belt Co., Chicago, Ill., has started construction of an engineering and manufacturing plant at Colmar, Montgomery County, Penn., for the production of elevating, conveying and processing machinery. The new plant will supplement facilities at Nicetown, Philadelphia, where the company has had a plant since 1888.

Flexible Tubing Corp., Guilford, Conn., has announced the appointment of Leo Martin as machine design engineer in charge of the machine development and design laboratory. He was formerly with New Haven Clock Co. James W. Hull, recently plant manager of Kelly Rubber Co., Massillon, Ohio, has been named chief of the chemical laboratory and development section.

Williams Patent Crusher & Pulverizer Co., St. Louis, Mo., announced the death of Reinhold E. Winter, who has been with the company for 47 years and has had the Williams sales agency in Chicago for the past 16 years. He was 64 years old.

Leeds & Northrup Co., Philadelphia, Penn., has elected I. Melville Stein as executive vice-president. He is also director of research. Mr. Stein joined the company in 1919 as a division manager in the sales department. He became research director in 1928, and vice-president in charge of research in 1944.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has announced the appointment of J. F. Roberts as director of engineering, and R. C. Allen as consulting engineer, for the general machinery division. Mr. Roberts has been with the company since 1919 when he joined the graduate training course. He was office manager in the hydraulic department until 1927 when he left to become hydraulic engineer with the Power Corp. of Canada. In 1936 he was named head hydraulic engineer for the Tennessee Valley Authority at Knoxville. In 1942 he returned to Allis-Chalmers as manager of the hydraulic department. Mr. Allen joined the steam turbine department in 1936, serving successively as chief engineer, assistant manager, and manager and chief engineer of the steam turbine department until 1947 when he became manager and chief engineer of the new turbo-power development department.

Crusher Plant Reduces Roll Maintenance Costs 65% with

Resisto-Loy



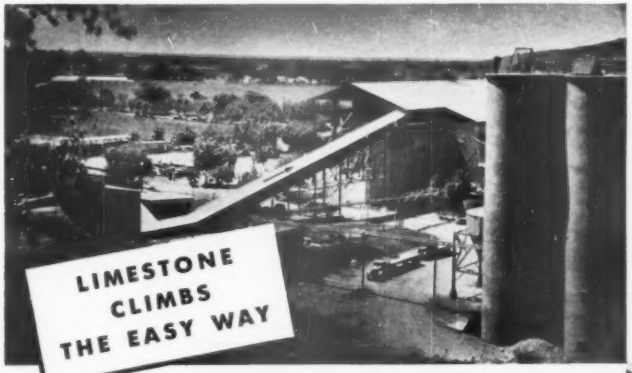
Users of RESISTO-LOY will tell you that at $2 a lb. it is cheaper to use than any electrode that sells at 50c a lb. Take a good look at the photograph.

This crushing plant was maintaining the rolls with a 50c rod, applying an average of 40 lbs. *every night* and 100 lbs. on weekends. In addition to this hard rod cost of $170 there was an average of 85 welding hours a week, or a combined total of $360 weekly.

Now get the comparison. One complete coverage of rolls with RESISTO-LOY cost $310, including labor. Crushing MORE TONNAGE of the same rock, in the same plant, with the same crew, for eight crushing days during which not an additional pound of RESISTO-LOY was applied. Then on the 8th and 9th nights the welders applied 40 lbs. of RESISTO-LOY between the beads of the previous deposit for a total cost of $102. It was 12 days later before RESISTO-LOY was again applied. So for $412 this plant maintained full crushing production for 20 days. Had they been using the 50c "hard rod," their over-all cost for 20 days would have been three and one-third times $360 or at least $1200.

Our Field Man would like to call on you and give you detailed costs and experiences of other crushing plants.

RESISTO-LOY COMPANY, Grand Rapids 7, Michigan



PONCE CEMENT CORP.
Ponce, Puerto Rico

Crushed rock, conveyed by 400-foot belt to top of storage building is discharged by S-A Traveling Tripper at any point over the 150-foot horizontal run above the storage bins. S-A bucket elevators are used elsewhere in the plant for handling cement. Photo below shows the inclined belt conveyor.

This S-A Belt Conveyor moves 300 tons of crushed limestone per hour for a cement plant that produces up to 7,500 barrels per day —a healthy tonnage! The rock is conveyed from crusher house at ground level to the top of the material storage building. A new *low-cost per ton* has been achieved for this operation. S-A engineers drew on more than 50 years experience in designing this installation—experience with all types of bulk materials handling equipment. *To aid your planning, write today for full information.*



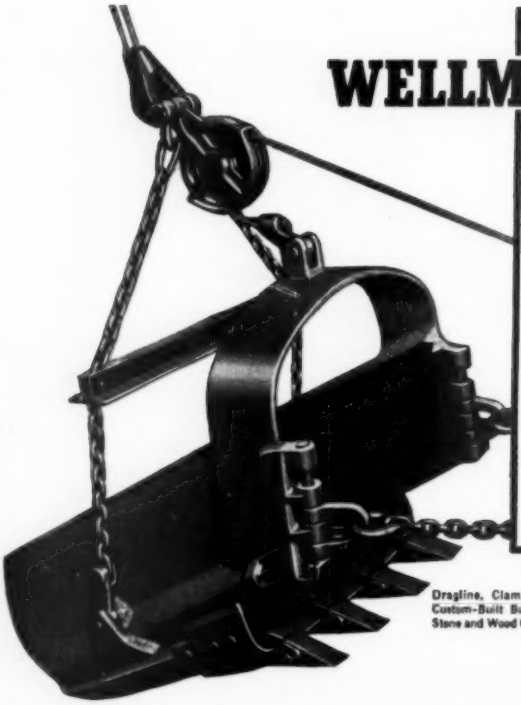
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MORE YARDAGE PER DAY

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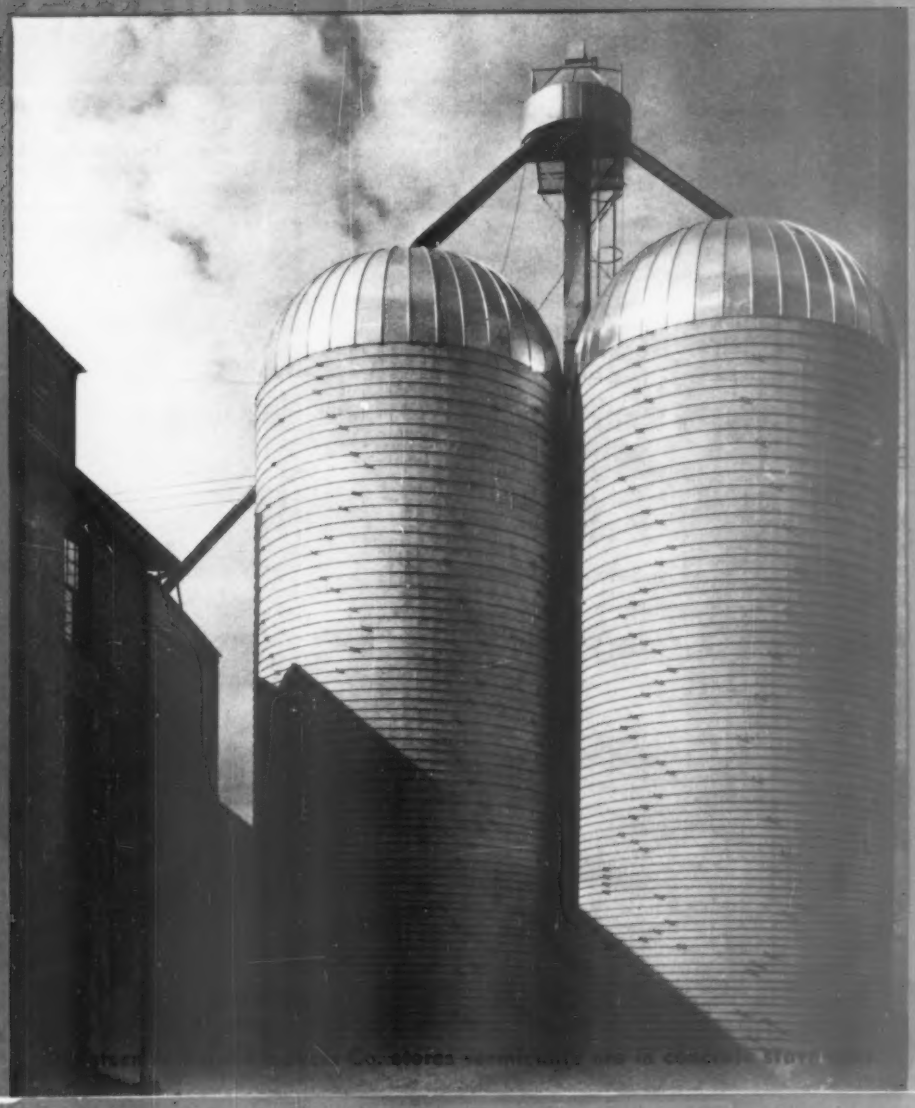
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INDUSTRY NEWS

Concrete Short Course

A CONCRETE SHORT COURSE was held December 3-4, 1951, at the Continuation Study Center at the University of Minnesota, Minneapolis, Minn. The latest findings and techniques in the use of concrete were illustrated. The course was sponsored by the North Central Commercial Aggregate and Ready Mix Producers Association, the Portland Cement Association, the American Concrete Institute, the Associated General Contractors of Minnesota and the American Institute of Architects.

Concrete Building Slabs

THE FLEXICORE CO., INC., Dayton, Ohio, recently announced a record construction performance in the use of its Flexicore precast concrete building slabs. "We erected 10,000 sq. ft. of roof slabs in one day," was stated in a field report received by the company. This instance was cited to indicate savings in erection time possible with the precast slabs on a large job under ideal conditions.

Average speed on an ordinary job was stated to be about 2500 sq. ft. per day with a 5-man crew which, according to the company, is equivalent of building forms for a 50- x 50-ft. slab, placing the reinforcement, placing the concrete and curing. The slabs are hollow cast in inch variations of length up to 22 ft. 6 in. and 26 ft. 8 in., depending on the cross section.

N.R.M.C.A. Protests to O.P.S.

VINCENT P. AHEARN, as executive secretary of the National Ready Mixed Concrete Association, has issued a protest directly to Michael DiSalle, director of the Office of Price Stabilization for failure to allow ready-mixed concrete producers to add to their ceiling prices the increased cost of transportation of in-area sources of raw materials for ready-mixed concrete.

Supplementary Regulation 66 to the General Ceiling Price Regulation covered an authorization from O.P.S. for adding to ready-mixed concrete ceiling prices the increased cost of out-of-area cement, both for higher mill prices and for transportation, but failed to provide relief for producers purchasing from in-area sources. Other industries have been given authority by O.P.S. to add to their ceiling prices the increased cost of transportation imposed by regulatory bodies, but the ready-mixed concrete industry has been forced to operate for several months on the basis of price ceilings which do not take into account the tremendous increases in transportation costs, which would seem to reflect unfair discrimination.

Mr. Ahearn stressed the fact that the ready-mixed concrete industry is composed essentially of very small companies whose survival is threatened unless the relief granted to other industries is also granted to them. Unless relief is granted soon, many companies will be forced with the choice of continuing to operate at a heavy loss or going out of business.

Septic Tanks Study

THE AMERICAN CONCRETE PIPE ASSOCIATION has distributed to its members copies of the article "Study on Septic Tanks and Septic Tank Disposal Systems," reprinted from *Agricultural Engineering*. The article deals with studies on household sewage disposal systems in various areas of the United States. Recommendations are made as to design, installation, maintenance and care for individual sewage disposal systems. The second part of the disposal system, the soil absorption field, is also discussed.

A.C.P.A. Meetings

THE AMERICAN CONCRETE PIPE ASSOCIATION held its "Short Course School of Instruction," November 26-28, 1951, at the Edgewater Beach Hotel, Chicago, Ill. Various subjects were covered during this three-day school, including hydraulics of sewer and culverts; packerhead pipe; tamped pipe; cast pipe; jacking concrete pipe; loads on underground conduits; bedding and backfilling; centrifugal pipe; special designs; hydrogen sulfide problem; and the status of the industry. Another feature was an inspection tour of the Portland Cement Association Laboratory in Skokie, Ill.

Among other recent meetings of the association was the fall meeting of the Southeastern Concrete Pipe Association, held in Knoxville, Tenn., October 8-9. The attendance of over 100 was the largest of any previous meeting of the group. The principal speaker was Dean Nathan Dougherty of the College of Engineering, University of Tennessee.

The Technical Problems Committee met November 27, at the Edgewater Beach Hotel, Chicago, Ill., during the time of the Short Course.

Cover Picture

THESE TWO LARGE concrete stave silos, holding 550 tons of vermiculite ore each, have been erected at the plant of Western Mineral Products Co., Minneapolis, Minn., to increase storage capacity from nine days production to 30 days. Common on farms, and gaining in use industrially to store cement, roofing granules and other materials, such structures are relatively new in the vermiculite industry. Ore is unloaded from freight cars into the 55 ft. high silos by a 75 ft. high bucket elevator, and transferred from them to the plant by the elevator and auxiliary screw conveyors.

HOWELL READY-MIX CONCRETE CO., has announced the removal of its ready-mixed concrete plant from Clay Center, Kan., to Parsons, Kan.

THE EMPIRE SAND, GRAVEL AND READY MIX ASSOCIATION'S October meeting at Syracuse, N. Y., was attended by 60 members, representing about 50 of the 125 sand, gravel and ready-mixed concrete companies in New York State. Various problems of the industries were discussed. Talks were given by Harry A. Barney, Barney and Dickinson Co., Binghamton, N. Y., and by Henry T. Hagen, deputy chief engineer of the New York State Motor Vehicle Bureau, on the subject of truck-mileage tax.

HINIKER BLOCK AND TILE CO., Mankato, Minn., has been sold to Judd Brown, a Mankato contractor. Harold A. Hiniker, former owner, will continue to manage the plant under the new ownership.

THE DAVIS CO., concrete block plant at Cannon Falls, Minn., was recently purchased by Alfred L. Scheer, Fairmont, Minn.

FRANK BALCERZAK, general manager of Guaranteed Gravel and Sand Co., Mankato, Minn., has purchased the interests of Al Rathai in the Wells Block and Tile Co., Wells, Minn. The business is being continued under two new firm names—Wells Concrete Tile Co. and Wells Ready-Mixed Concrete Co.

SCHMIDT CONCRETE PRODUCTS CO., St. Joseph, Mo., has been acquired from the estate of the late Oscar Schmidt by St. Joseph Concrete Products Co., a new concern of which H. D. Allison is president and F. O. Davis is secretary-treasurer.

COLORADO PRE-MIX CO., Denver, Colo., has been issued a subcontract to furnish 50,000 cu. yd. of concrete, at a cost of approximately $500,000, for use in the construction of the $45,000,000 Rocky Flats atomic plant.

USINA CENTRAL DE CONCRETO S. A., Brazil's first pre-mix concrete company, recently began production at its Sao Paulo plant. The company was organized by the engineering firm of Tavares & Pinheiro Ltda. The plant has a capacity of 50 cu. m. per hr. Delivery is by a fleet of 10-ton trucks, mounting 3.3 cu. m. transit mixers. U. S. equipment was used throughout the plant.

VINELAND TRANSIT READY MIX CONCRETE CO., Vineland, N. J., has announced the establishment of a branch plant and office in Cologne, N. J.

A CONCRETE SHORT COURSE for students, engineers, architects and contractors was held recently at the University of Notre Dame, South Bend, Ind. Demonstrations on how to achieve quality concrete were given by C. V. Wallace of Indianapolis, Ind., who is a field engineer of the Portland Cement Association.

THE PUBLIC BE *PLEASED!*

HERE'S WHY THEY ASK FOR 'INCOR'

Roanoke, Like Many Other Well-run Cities, Repaves with 'Incor' — Saving Motorists' Time and Tempers





● Closing a busy street like Salem Avenue in Roanoke, Virginia, for repaving can be a prolonged headache for motorists, a serious trade loss for merchants. But not if the city follows a policy of the public be PLEASED:

Like John L. Wentworth, Roanoke's Director of Public Works, who used 'Incor' 24-Hour Cement for repaving busy Salem Avenue from Jefferson Street, W., to Second Street, S. W.

Placed one day, 'Incor' concrete carried heavy mixer trucks the next. Result, Mr. Wentworth estimates a saving of 45 days' traffic tie-up.

Salem Avenue is typical of many a busy main stem the country over. With 'Incor', motorists praise the foresight of progressive city fathers . . . merchants save sales that would otherwise be lost.

Good news for taxpayers, too . . . because dependable 'Incor'* high EARLY strength saves at the go in . . . dependable high ULTIMATE strength saves tax outgo, through extra years of maintenance-free service.

Performance like this explains why Ready Mix Operators make 'Incor' concrete available as part of their good service. Users KNOW they can depend on 'Incor', America's FIRST high early strength portland cement.

*Reg. U.S. Pat. Off.

ROANOKE, VIRGINIA, SALEM AVENUE REPAVING
Engineers: **CITY OF ROANOKE ENGINEERING DEPARTMENT**
JOHN L. WENTWORTH, Director of Public Works
H. C. BROYLES, City Engineer
Contractor: **PIONEER CONSTRUCTION CO., INC.**, Roanoke
Ready-Mix 'Incor' Concrete: **CONCRETE READY MIXED CORPORATION**, Roanoke



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MASONRY PRODUCERS LOOK FOR RECORD YEAR

Producers express optimism for 1952 at N.C.M.A. New Orleans meeting. Government and economic factors considered

THE SOUTHEASTERN REGIONAL meeting of the National Concrete Masonry Association, held at the Roosevelt Hotel in New Orleans, La., Nov. 5-6, attracted one of the largest number of members ever to attend a regional meeting. The theme of the meeting was "What To Do In '52?" Presenting their views were a banker, architect, government representative, and members and officers of N.C.M.A. The Texas Concrete Masonry Association also held its annual meeting in conjunction with this N.C.M.A. meeting.

George Katterjohn, perennial master-of-ceremonies and a past president of N.C.M.A., opened the meeting by calling on producers from all over the country to report business conditions. Invariably the outlook was favorable; some expected as good if not a better year in 1952, as compared to 1951, the biggest year in history. The only dark cloud on the horizon was a possible cement shortage. Civilian construction will create a terrific demand, but military requirements on top of this already heavy demand should account for the banner year, according to the consensus of opinion.

Concrete Masonry Acceptance

O. J. Baker, a professional architect and member of the faculty of Louisiana State University College of Architecture, discussed two things — the L.S.U. small home research project, and his views of what the public thinks of concrete masonry. The design of a small home was undertaken by Mr. Baker and his associates in an effort to obtain a low-cost unit made of readily available materials. Concrete masonry was chosen as the basic material. No attention was paid to F.H.A. restrictions or building codes in the design, since the object was to obtain research data on paring costs to the utmost. A 6- x 8- x 16-in. concrete block was used for the walls of the house, which was 24 x 30 ft. outside dimensions. The floor was of colored concrete. Two coats of waterproofing material were placed on the outside wall, and one coat was placed on the inside. A colored oil paint was also put on the inside walls.

Electricians, plumbers, carpenters and other craftsmen completed work on the house at the rates prevailing for Baton Rouge, La., (in 1946). The total cost of the house amounted to $5040, though at present day prices the speaker estimated it would cost $7000-$7500. This house design was displayed in *Better Homes & Gardens* and adopted as one of its Five-Star homes, resulting in over 30,000 inquiries. Over 300 homes of this design have been built, Mr. Baker estimated. In the original home, in which he lived for three years, no condensation appeared at any time on the walls or ceilings. The original paint is still in excellent condition, and only small cracks have appeared in spite of the absence of reinforcing steel (omitted to compile research data and to cut the cost).



A. G. Streblow, Basalt Rock Co., Napa, Calif., center, and R. E. Copeland, N.C.M.A., right, compare viewpoints with another association member

Mr. Baker claimed to be in a good position to determine what many people think of concrete masonry construction, since he was called on to make a survey. Much of the opinion is unfavorable, he reported, most people having seen and remembered bad examples of concrete masonry construction. They immediately think masonry walls crack easily, cause condensation, and don't look presentable.

In most cases, the speaker said, this is directly traceable to a poor job by the mason. Placing block in hot weather results in drying out of the mortar, increasing the possibility of cracking. In most cases of bad results, waterproofing was poorly done and there was no steel reinforcing. The moisture condensation proved to be a different matter—it wasn't the fault of the masonry wall, but in many cases due to the fact that space heaters were not vented to the outside. Moisture from the burning gases condensed on the cool wall surface. Most unpleasant-looking masonry houses were not designed by an architect, he claimed.

Mr. Baker offered the suggestion that architects and designers should not try to make concrete masonry look like some other type of construction material. It's a good material in its own right, he said, and deserves the best treatment.



The New Orleans meeting hosts were (l. to r.) Lewis Lloyd, Alatex Concrete Co., Herbert G. Jahncke, Jahncke Service Inc., and T. J. Goodbee, Crescent Concrete Products

Economic Outlook

Wallace Davis, Hibernia National Bank in New Orleans, was introduced by Herbert Jahncke of Jahncke Service Inc., a new member of N.C.M.A. and one of the New Orleans hosts. Mr. Davis first spoke on basic economic matters, the gold standard and the managed money policy. He pointed out why production cannot increase fast enough to lower unit production costs. The necessity for credit restrictions was pointed out by the speaker. Mr. Davis attacked current immorality in government, but said that much of the









Top left: (l. to r.) John P. Sheehan, The Atlas Building Products Co., El Paso, Texas; George L. Oswalt Co., Forest Park, Ill.; and W. R. Ireland, Atlanta Aggregate Co., Atlanta, Ga., involved here in a discussion. Top right: (l. to r.) F. W. Elliott, Muscogee Concrete Products, Columbus, Ga.; Jack Rose, Sheffield Concrete Block Co., Sheffield, Ala.; Eugene Steneck, Alpha Portland Cement Co., Birmingham, Ala.; and L. K. Camp, Camp Concrete Products Co., Columbus, Ga., get together. Bottom left: R. E. Copeland (left), director of engineering, N.C.M.A., Chicago, Ill., and John S. Bailey, Concrete Mfg. Co., Atlanta, Ga., discuss technical problems. Bottom right: The registration desk was crowded the first day of the meeting—more than 200 men and their wives registered

attitude was due to business and industry itself. Every business wants benefits for itself alone, with no regard to the economy as a whole.

Mr. Davis concluded by making a few predictions. In his opinion, costs and wages will continue to go up, and more new money, possibly $5 billion, will be pumped into the economy. The labor supply will remain tight, partially because there will be little incentive for workers to better themselves by taking a more lucrative or more skilled job. But one fact remains clear, the speaker pointed out—1952 will bring this country a year closer to the inevitable readjustment. The U.S. is not at all depression-proof, he emphasized, so business and government should think of the future more seriously and more clearly than it has in the past.

Government Regulations

A question and answer period was devoted to explaining some of the perplexities of National Production Authority regulations. William West, industrial analyst, provided the answers. He said that a separate application should be filed under F-2 for each classification of material, e.g., electrical, steel and other supplies. Applications for materials for housing purposes should be directed to Office of Civilian Requirements, Washington 25, D. C., including a letter of transmittal stating the applicant's type of business and needs.

One member of the audience complained that although he received authorization to purchase steel, his supplier could not make delivery. Mr. West replied that unfortunately many priority users have placed orders with a number of suppliers, lowering each available supply. The situation should improve greatly next year, when the regulation covering this is made stiffer. Mr. West answered a question about defense housing areas by stating that no other building could go on in such an area until the critical housing situation is alleviated. It isn't an advantage to have one's locality declared a defense area in this respect, he said.

Control of Cracks

W. R. Ireland, president, Atlanta Aggregate Co., Atlanta, Ga., presided at the second session. Portland Cement Association representatives figured prominently in the afternoon's program. H. J. McDargh, southeastern regional manager, introduced D. L. Chaney, P.C.A.'s regional structural engineer.

By means of slides and commentary, Mr. Chaney gave a valuable presentation on crack control. Most cracks in walls are blamed on poor concrete masonry units, but in many cases the fault may lie in the architect's design. To emphasize this point, and to show how producers can help reduce the occurrences, he gave the case history of a school in Charlotte, N. C., which developed a few cracks within a year after construction. Only three of the cracks he found upon investigating the building could be blamed on masonry shrinkage. Many more than this were due to design.

The school is 200 ft. long. The wall was a solid mass of concrete block broken only by window area; no control joints were used. A cast-in-place concrete beam carried around the perimeter of the building. Mr. Chaney blamed shrinkage in the perimeter beam for causing cracks at each corner. These cracks were up to ¼ in. wide at the building edge, tapering off step-wide and vanishing about 2-3 ft. from the corner. This indicates that the resultant of the beam shrinkage forces was pulling the corner inwards, he said. This could have been eliminated by incorporating a slide plane between the roof and wall, and at wall corners, where most cracks occur.

Cast-in-place concrete lintels also caused cracking of the concrete bearing brick at the same school. Again a

slide plane would eliminate this. The contractor had placed tar paper between the lintel and brick, but the weight of the former prevented a sliding contact. In later designs the roughness of the brick was reduced by capping with mortar, and heavy tar paper used, a procedure which effectively prevented these cracks from recurring.

Cracks occurring at interior partition wall control joints were found to be due to the wall design; to fit steel I-columns in place, the face shell of a column of block had to be removed. This left little to prevent the cracks from becoming fairly wide.

Mr. Chaney showed slides of the cracks and how they were formed. Also shown was a graph of the effect of drying to relative humidity equilibrium on shrinkage size. Much shrinkage can occur in block meeting A.S.T.M. specifications of 40 percent total absorption present in the block.

Secretary's Report

E. W. Dienhart, N.C.M.A. executive secretary, presented an interim report on accomplishments this year and what the outlook is for next year. The steel shortage may affect producers more in the future, particularly with respect to home building. The price structure on masonry units is not unfavorable at present, but is quite likely to improve in the coming year, he said. Cement may prove a bottleneck, according to Mr. Dienhart; in fact, N.P.A. has reportedly drafted a regulation to allocate 80 percent of the cement supply to rated users. Naturally N.C.M.A. will oppose any such move.

Horace Bush, president of N.C.M.A., made a few remarks on his job as president. He felt that every producer should be making a good profit, unless poor management or old equipment prevented this.

In the open forum following Mr. Bush's remarks, Ralph Rogers, of Texas Concrete Masonry Association, acquainted the N.C.M.A. members with a resolution drafted by T.C.M.A. for presentation before the national group. This was to the effect that N.C.M.A. should establish a Washington office to acquaint law makers and the thousands of government employes who interpret the laws with the needs of the industry. His proposal was that a competent man or men be engaged not later than March 15, 1952. If additional funds would be necessary, he suggested that all members contribute the small amount needed according to production. Mr. Rogers eloquently pointed out how valuable such a Washington office could be. The matter was referred to the board of directors for action and for inclusion in the annual convention program in February.

A Producer Views the Future

The second day's meeting was presided over by M. E. Rinker, Rinker Materials Corp., West Palm Beach, Fla. Charles W. Ireland, president, Birmingham Slag Co., Birmingham, Ala., was the first speaker. His subject was "How an Aggregate and Block Producer Views '52." He is acquainted with both aspects of business, for his company is engaged in both fields.

As for aggregates, he felt that demand would be heavy next year. In 1950, 600,000 carloads of aggregates were handled by the railroads. In 1951, it is estimated they will handle 725,000. The car shortage will become more acute next year, he said, due to the great demand for hopper and gondola cars (which the railroads classify as coal cars) to carry coal to ports for export, and to receive imported ore. Old cars are being retired faster than new ones can be built. Thus there is little prospect of an easing of the car shortage. Strikes may also affect transportation of aggregates adversely.

Though the demand for aggregates is already high, government demand is going to be terrific, Mr. Ireland said. He estimated that more government construction contracts will be let in 1952 than ever before. Another competitor to block plants and the government for aggregates is asphalt paving. This is the largest competitor for minus ½-in. sizes, for hot and cold asphalt contractors need the same size as do block producers, the speaker said. Furthermore, because of the steel shortage and possible cement shortage, more highways will be surfaced with bituminous materials than formerly, creating more demand and more competition.

Lightweight aggregates, at least slag, in Mr. Ireland's opinion, will be in ample supply in his area. Strikes and the shortage of rail equipment will be the only factors affecting this supply. As for cement, he felt that shortages will be local and temporary,



Two New Jersey producers meet at the convention; Horace Bush, (left) president of N.C.M.A., Multiplex Concrete Co., East Orange, and W. S. Phillips, Arthur Rehberger & Son, Inc., Newark



A perennial visitor to N.C.M.A. meetings, George Katterjohn, Paducah, Ky. (right) takes time out in talking to F. J. Jacks, Concrete Products Co., Clarksdale, Miss., to pose for a picture





Operation of the Johncke Service Inc. block machine seems to intrigue these visiting members on the N.C.M.A. field trip



Herb Jahncke (left, standing) has just introduced the Mayor of New Orleans, deLesseps S. Morrison, who spoke at the luncheon meeting

and will be minimized because of the 7,250,000 bbl. increased cement plant capacity in the southeast. The speaker offered the suggestion that about the best solution to alleviate supply headaches is to carry as large an inventory as possible, both of raw materials and finished products. Labor will continue to be a problem, and wages will go up, but most plants, he felt, could make operations more profitable by reducing downtime.

A dynamic speech was presented by Dr. J. L. Brakefield, director of public relations for an insurance company. Dr. Brakefield traced the historical factors, physical and spiritual, that have made this country great. He's great pride in the democratic system and the religious foundation of this country was carried through his talk. Dr. Brakefield received a standing ovation for his stirring espousal of our freedom and its place in a restless world.

Engineering Reports

Two N.C.M.A. officials presented brief reports of their work. R. E. Copeland, director of engineering, described the solution of a problem presented two years ago when the Corps of Engineers contemplated leaving concrete masonry out of its specifications. Prompt action by N.C.M.A. and P.C.A., through the preparation of a report outlining the causes of the Corps of Engineers troubles with cracks, prevented this action. In the preparation of this report, 25 government projects were visited, Mr. Copeland said. Specifications formerly listed clay products as the desired material and concrete products as optional, but recently the Corps of Engineers reversed this, listing clay tile as the optional material. This was also influenced by the University of Toledo research project on concrete masonry units, initiated in May, 1950.

Mr. Copeland repeated some important parts of recent N.C.M.A. Technical Reports. New research activities include determination of the amount of reinforcement needed with concrete masonry units; sound absorption studies on plastered concrete masonry walls; and effect of mixing time and mixer speed on strength of units. Research also showed that covered storage piles, properly vented, will give an equilibrium dry block in two to three weeks.

Charles Alverson, N.C.M.A. field engineer, presented the second report, an account of his 30,000 miles travel in the eight months he has been with N.C.M.A.

Social Events

Nearly 90 ladies attended the social activities of the convention. Men and women attended a luncheon the first day of the convention and heard an address by Mayor deLesseps S. Morrison of New Orleans, who showed slides and described improvements made throughout the city in public works. The ladies were then taken on a walking tour of the Vieux Carré, visiting several private homes. On the second day the ladies took a harbor boat trip. Cocktail hours were held on both days of the convention. Many members attended the dinner-dance in the Blue Room of the Roosevelt Hotel the final evening.

A feature of this year's convention was a field trip to two concrete products plants. First visited was Jahncke Service Inc., which began making concrete block last July, operating one Besser Super Vibrapac. Next visited was Alatex Construction Service's perlite expanding plant and the Alatex concrete block plant.

Eschenbrenner Awards

UNIVERSAL CONCRETE PIPE CO., Columbus, Ohio, has announced its second annual "Eschenbrenner Awards" competition which is open to all civil engineering students in senior classes of colleges and universities in the United States, east of the Mississippi river.

An annual cash award of $500 is made for the best original research paper submitted in each of the three districts—central, southern and eastern. Subject matter of the papers must relate to non-monolithic concrete products. Deadline for entries is March 31, 1952.

Papers submitted will be judged by an award jury of practicing engineers. In addition to the $500 checks, the winners will each receive a silver medallion and a trip to Columbus where they will be guests of the company. The awards are sponsored by Universal Concrete Pipe Co., of which H. X. Eschenbrenner is president.





Left: Visitors at Alatex Construction Service block plant inspected lightweight perlite units. Right: New warehouse at Alatex features the use of precast perlite wall slabs

Ready-Mixed Concrete For Chicago Area

Imperial Ready-Mix Concrete Co. has carefully engineered plant. New truck mixer designed to meet highway load limitations



Central-mixing plant with truck in position for loading. Operator is seated before open window in center top. Loud speaker for communicating mixing plant operator's instructions to truck drivers is located above truck

By L. DAVID MINSK

SINCE READY-MIXED CONCRETE was first introduced in the Chicago area in the middle of 1948, its use and acceptance have increased steadily. Competition has increased also, as more and more producers entered the picture to take a share of this expanding field. Plant efficiency has become an increasingly important factor in determining which producers remain successful.

Imperial Ready-Mix Concrete Co., Melrose Park, Ill., (a western Chicago suburb) was one of the first ready-mixed concrete producers in the Chicago area, and since beginning operations in June, 1948, has continued to grow and improve its plant facilities. Its central mixing plant has many refinements which contribute to efficiency and flexibility, and in addition the company has designed two sizes of trucks around its operation. These trucks have proved so successful that Imperial is producing them commercially. A subsidiary, Imperial Construction Equipment Co., has been organized to manufacture the mixers.

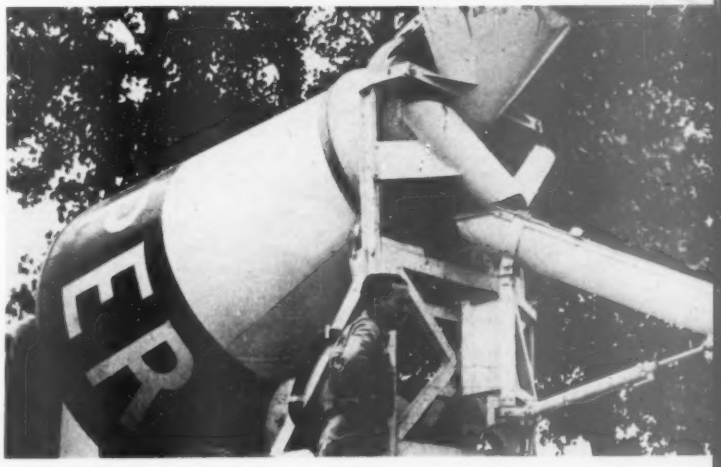
The company has delivered 125,000 cu. yd. of concrete from its plant in one year. The peak day's output to date has been 892 cu. yd. A 3-cu. yd. Smith tilting mixer is used, though this is occasionally loaded to 4 cu. yd.

Imperial's management is aggressive and receptive to new ideas. The latest of many developments is a batching set-up controlled by an operator seated before a central switchboard much like an organ console. The company spent much time and effort in developing mechanical aids for the central mix batching operator. The goal was not to make everything as automatic as possible and thereby eliminate the "human factor," however. The company takes the practical view that a competent, well-trained individual can add an intelligence to the batching operation which machines are incapable of achieving. Three of the six men qualified to act as batching operators have attended National Ready Mixed Concrete Association's concrete school, and all have had much practical experience.

At the present time only water is measured automatically (by volume). An automatic cut-off pneumatically-controlled cement weigh batcher is being installed. No automatic cut-off is to be added to the aggregate weigh batcher, however, since this is the operation the company feels will benefit most from the batching operator's judgment and control. In a plant having a large mixer handling many small and varied orders, the time saved in not having to change weights on an automatic scale is substantial, in the management's opinion. They feel that only when a great number of constant proportion mixes are to be run is an automatic control more saving of time. The ratio between sand and coarse aggregate is left to the judgment of the operator, as long as the total weight meets design figures. The manual control makes this more flexible.

The operator's station has been designed efficiently. Both feet and both hands are kept busy, but all controls are grouped logically for ease of operation. The left hand controls the intercom, mixer tilt, and cement additive timer, as well as some of the weigh batcher gates. The right hand is used for setting the water meter, weighing aggregates and cement, switching bin vibrator on and off, and for opening and closing some of the bin gates. The left foot controls the

A 3¾-cu. yd. truck mixer of Imperial's design in operation on a job

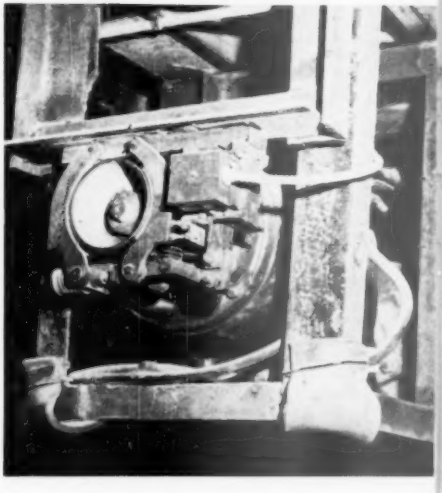






Left, above: Over-all view of the plant. Office is at right; central-mixing plant is just to left of office. Right, above: Inclined belt conveyor to shuttle conveyor over silos is in foreground. Shuttle conveyor is reversible, and discharges to silos and batching plant bins (left). Right: Central-mixing plant operator sits before a control board over the mixer. Batching controls, intercom, facsimile writer, scales and water meter are conveniently located around him. Below: Single-speed 5-hp. gearhead motors are used on the cement and fly ash batching screws. A brake on the end of each motor shaft stops the motor instantaneously and eliminates need for two-speed motor





up and down movement of an adjustable sleeve between the mixer discharge funnel and the truck mixer hatch. The right foot opens and closes a trap door in the floor through which the operator can see the truck while it is being loaded.

An ammeter connected in the mixer motor circuit is the means of timing each mix. No constant mixing time is given; instead, when the ammeter needle stops dropping, the operator has a good indication that the mix is ready for discharge. This could also provide a means of estimating slump, but such use is not considered very important with an experienced operator. Though only 5-10 seconds may be saved on each mix by following the ammeter indication, the company feels that the $20 spent for its installation is repaid each day in cumulative saving of time.

Water is measured by a Neptune meter on a 2-in. line. The water flows into a 120-gal. capacity tank. Air-entraining agent (Darex) stored in a tank above is measured in a graduated glass column, from which it too goes into the water storage tank. If too large a quantity of air-entraining agent was measured, only part may be let out through the discharge valve to the tank. Pozzolith can be added automatically to the same tank.

To prevent water pressure from dropping during the batching operation, when trucks are rinsed off, wash water is stored in three oil drums for gravity feed. An ordinary toilet bowl float valve unit keeps these filled. The line used to feed the tanks is so small that pressure is unaffected. A booster pump is used to increase city water pressure. When first installed, water hammer was terrific when any valve was shut off suddenly. Installation on the mixer floor level of a 4-in. pipe filled with compressed air eliminated this entirely.

All batching controls are pneumatically operated. Each weigh batcher and bin gate is opened and closed by an air ram. Two 15-hp. Ingersoll-Rand compressors provide 120 c.f.m. of air for this purpose. Both pump to the same compressor tank, but this is in process of being changed so that one will be used primarily for the batching controls and the other for miscellaneous purposes. However, they will be interconnected by a manifold.

Cement batching at the present time is not pneumatically controlled. The basic design here is worthwhile. A 14-ft. long, 12-in. diameter cement screw is driven by a 5-hp. single-speed Sterling gearhead motor. This is stopped instantly by a compression brake on one end of the motor shaft. While the motor is operating, a solenoid holds the brake open, but as soon as the current is interrupted, the solenoid releases and springs close the brake. The company added the brake to take advantage of the lower initial cost and reduced maintenance offered by a single-speed motor.

Plant Design

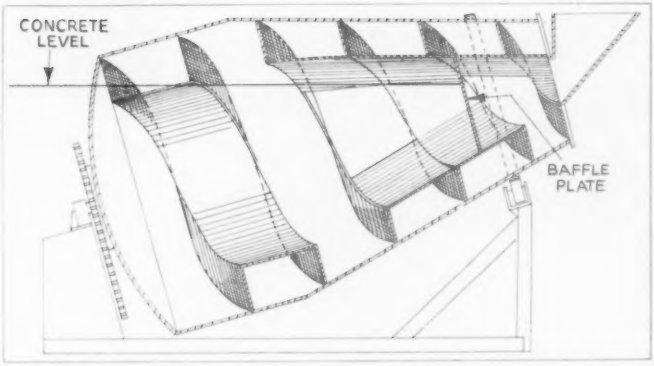
The plant is located alongside the Proviso yard of the Chicago and North Western railroad. This is the largest freight handling yard in the world. Imperial's siding is practically a part of the yard, and the rapid service thus afforded has prompted the company to claim it has the best rail service of any plant in the country. There is room to spot 45 cars on the siding, 2200 ft. of which is single track and 1000 ft. of double track. Two track hoppers are provided for aggregates; bulk cement can also be unloaded to a cement screw below track level. Cars are spotted either by two 10-hp. Link-Belt car pullers or by an Allis-Chalmers HD-5 tractor. The latter is generally used to avoid long reaches of cable.

Aggregates from hopper cars fall

to a 24-in., 40-ft. long belt conveyor under the tracks. This delivers to an inclined conveyor made up of two sections, one 120 ft. long and the second, at an acute angle to the first, 126 ft. long. This discharges to a 75-ft. reversible shuttle conveyor over four 800-ton capacity concrete stave silos. The shuttle conveyor can fill any silo or bins over the central mixing plant. Material stored in the silos can be withdrawn to a 110-ft. belt conveyor in a reclaiming tunnel. An intermediate 60-ft. conveyor closes the circuit to the inclined conveyor. A supplementary ground level hopper at one end of the reclaiming tunnel can be used to unload aggregates if necessary. All conveyor belts are 24 in. wide. The conveyors themselves were made by Barber-Greene.

The company has made it a point to design flexibility into its plant. Concern for breakdowns and the competitive situation have prompted this. One thing that has been done is the installation of two motors on the head ends of inclined belt conveyors. Either motor can run the conveyor by changing a set of gears, a 15 min. job. The newer motors installed in these locations are Sterling gearhead units. In case of motor failure, then, little time need be lost in getting back in operation. Electrical outlets are placed in many points around the plant, and three hoist booms are spotted to haul motors and other heavy equipment to the top.

The conveyors can be controlled from two interconnected switchboards. One is near the track hoppers, and the other is on top of the batching bins. In practice, one man stays near a switchboard during operation. In case of an accident of any kind the motor can be stopped quickly by a man at the upper switchboard.



Section drawing of Imperial's mixer design; concrete is picked up in the "tunnel" at right and carried by rotation to the left, from which it flows by gravity towards the baffle plate

Cement is stored in two silos and a bin holding a total of 3000 bbl. The company is constructing a cement screw and elevator with capacity to handle 800 bbl. per hr. to supplement the present elevator. Another bin has been added to store 125 bbl. of fly ash.

Winter Operation

Water is heated in winter by steam from a Kewanee 100-hp. boiler. A heat exchanger is used. The company does not feel that there is much danger of flash set occurring in the mix by using hot water. Fast mixing distributes the heat of the water away from the cement fast enough to permit a water temperature as high as 212 deg. F. Water temperature is controlled by a Partlow Corp. (New Hartford, N. Y.) controller. This functions by opening a steam valve into the heat exchanger when the temperature drops 5 deg. below the set point.

Quality Control

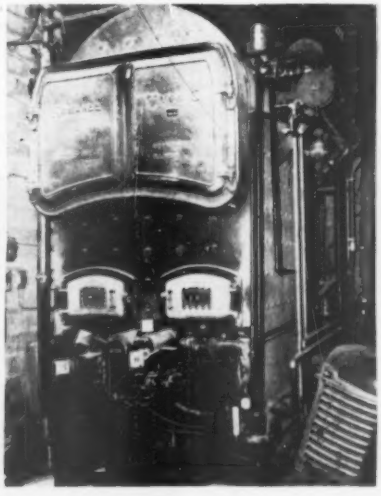
Samples of mixes are taken frequently while the mixer is discharging. Tests run include air content and yield, as well as compressive strength. A chart devised by Paul MacKinney, quality control engineer, tells at a glance what the yield is, given the batch weights and weight of concrete. Accurate records are kept. If a test cylinder were found to be below required strength, the records could tell where that batch of concrete was placed. A 100-ton testing machine is being installed in the plant laboratory.

Dust Control

Imperial solved the problem of dust being carried into the street by truck tires by installing a 1½-in. pipe the length of its drive; holes in the pipe permit the drive to be wet down periodically. The valve controlling this is

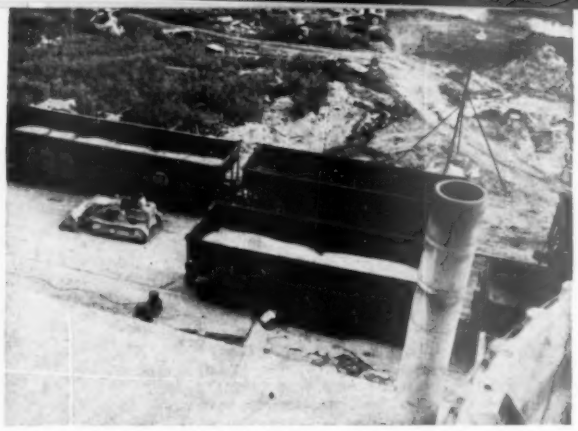
Left: Reversible shuttle conveyor operates on track over four concrete stave silos, each of which holds 800 tons of material. Center: Boiler, of 100-hp. capacity, is in shop adjacent to the central-mixing plant. Steam is generated for heating water in a heat exchanger. Right: Plant officials are, left to right, Paul MacKinney, quality control engineer; J. Foster Oury, president; and Ralph Oury, vice-president in charge of ready-mixed concrete











Left: Employes of Imperial's ready-mixed concrete plant. Right: Aggregate track hoppers are along the double-track siding; both car pullers and a tractor are used for spotting cars. View is from top of aggregate silo

near the central mixing operator's station. He is in the best position to know when water pressure is available for this. Further cleaning of the drives is done by a small power sweeper. An American Wheelabrator dust collector is located in the mixing plant. A wash rack for cleaning out trucks has also been installed.

Mixers

The company operates 25 agitator-type truck units. Six are 4½-cu. yd. capacity mixers with power take-off. The opinion of Imperial's management that truck payloads could be increased by eliminating the separate drum engine led to modifying these mixers. Though they were successful, Imperial decided that the only way to get the payload increase desired was to design a mixer from scratch. The goal was to carry a full 4-cu. yd. load of concrete and not exceed the Illinois weight limits of 18,000 lb. on the single rear axle and 6000 lb. on the front axle. This goal was almost reached—the design perfected allows 3¾-cu. yd. to be carried legally.

Hydraulic power was selected for the drum drive since torque would be applied smoothly. Initial experiments with a fluid drive showed this to be unsuccessful since the starting torque was too high and a unit rugged enough to do the job would have been prohibitively heavy. A shaft from the transmission powers the hydraulic pump. This provides high pressure fluid to drive a motor connected to the drum through two chain drives with a 22:1 gear ratio. A four-way valve can change the direction of rotation smoothly. The hydraulic system weighs only 130 lb. Adoption of this drive system allows the wheelbase of the truck required to be shortened by 2 ft. The center of gravity was also lowered.

Another goal of the company was to eliminate jointed chutes, and to raise and lower the chutes mechanically. This was done by using a 14-in. diameter, 5-ft. long chute connected to a hydraulic cylinder. A 12-ft. long chute of 12 in. diameter can nest inside the shorter chute. It is not necessary to lift this chute into position from its carrying cradle on the side of the truck. The short chute swings underneath where the 12-ft. chute can be dropped into place and held with lugs. The discharge end of the drum was raised 18 in. above most other standard truck mixers. Twelve truck mixers embodying these features are part of the truck fleet, all built in the company's shops.

Imperial has lately developed a 6¼-cu. yd. mixer which will stay under the legal Illinois maximum of 32,000 lb. on a tandem rear axle and 9000 lb. on the front axle. The design of the mixer has been improved. It appears like a long truncated cone, in contrast to the smaller mixer which has a cylindrical section to the front of a cone. Again, 2 ft. were taken off the wheelbase by the use of a heavy-duty hydraulic system. The principal refinement has been in design of the blades to give a positive end to end displacement of the concrete. Concrete is trapped in a tunnel at the front end and carried by the rotation to the rear. The level is higher there, so it flows toward the front to repeat the cycle. The company feels that this design gives superior mixing action. One mixer has been built and is in use. At the present time this must be hatch loaded, though a tail loading unit is under development.

Imperial's organization is small, and J. Foster Oury, president, works closely with others in the company in the design of new equipment and production of controlled ready-mixed concrete. These include Ralph Oury, vice-president in charge of ready-mixed concrete; Paul MacKinney, quality control engineer; Mark MacKinney, plant superintendent; and Bill Berning, principal central mix operator. Clyde Petrossi is superintendent of manufacturing production and Bill Hohl is draftsman in the equipment production section.

Left: Plant laboratory, in which sieve analyses, air content, yield and other tests are run. Right: Dust tracking into the public highway is reduced by wetting the company's drive with water forced through the pipe line visible at right, in which holes have been drilled





A. C. I. Stresses Quality Concrete

Ready-mixed concrete and modern practices in formwork and pavement construction featured at St. Louis regional meeting

FOLLOWING ITS POLICY of holding alternate regional meetings in the Midwest, American Concrete Institute members met in St. Louis, Mo., on October 30-31 for the fall meeting. The large attendance of 125 followed a packed schedule to hear the dozen talks and to partake of the social activities offered during the two-day meeting. A field trip on the second day took members to interesting points of concrete construction in the St. Louis area.

The president of the institute, Harry F. Thomson, Material Service Corp., Chicago, Ill., and two past presidents, Frank H. Jackson, principal engineer of tests, Bureau of Public Roads, Washington, D. C., and H. J. Gilkey, head, department of theoretical and applied mechanics, Iowa State College, Ames, Iowa, were the chairmen for the three technical sessions.

In his opening remarks of the meeting, Mr. Thomson remarked that following the annual convention of the American Concrete Institute in Cincinnati, Ohio, in February, Harvey Whipple, secretary-treasurer, will retire after over a quarter of a century with A.C.I. At that time Fred Van Atta will take over as secretary-treasurer.

Ready-Mixed Concrete Quality

A survey of ready-mixed concrete practices in the St. Louis area was presented by A. W. Brust, department of civil engineering, Washington University, St. Louis. Professor Brust's findings were none too complimentary to the industry. His statistics listed the composite of the 24 firms in the area operating 27 ready-mixed concrete plants.

The majority use bulk cement and buy from two or more sources. Mississippi river sand was used chiefly, though some Missouri and Meromee sand is used. All is dredged, a possible factor in the deficiency of minus 100-mesh sizes, he said. The fineness modulus is low, 1.8-2.4, which contributes to a high water requirement. Gravel is supplied to the ready-mixed concrete industry from eight plants. The size distribution varies considerably from location to location, and most ready-mix firms do not take this into consideration when receiving aggregate from different sources.

As a result of these factors, Professor Brust claimed that the quality of ready-mixed concrete varied widely during the course of his survey (1947-1950). A trend he reported noticing was the reduction in cement content; in 1947 a 1:3:5 concrete mix included 4¾ bags of cement per cu. yd.; in 1949 this had decreased to 4 bags; 3.8 bags in the case of air-entraining cement. A step in the right direction has become evident in 1951, he said, for many companies are now selling by cement content.

More must be done before ready-mixed concrete can be called a controlled manufactured product, emphasized Professor Brust. Contractors also have to learn the proper methods of using concrete, which the speaker elaborated on by recounting the practice of one contractor who regularly uses 10 gal. of water per sack and a 4-bag mix, then strips forms 24 hr. after placing. In the course of the survey Professor Brust said he noticed on one job 20 in. of water on the top of a wall just before stripping.

The outlook for improving concrete quality is becoming more favorable, however. He felt that most poor concrete is due to inadequate supervision of workmen, and plain ignorance of the means of obtaining good concrete.

Though many in the audience did not agree with Professor Brust's picture of ready-mixed concrete quality, most agreed that much more could be done to improve quality.

In the discussion period that followed his talk, Clarence Ax of Jones-Kissner Co. mentioned that Southwestern Bell Telephone Co. had refused to accept construction bids for ready-mixed concrete since it was claimed that quality was poor on previous jobs. Stanton Walker, director of engineering, National Ready Mixed Concrete Association, was asked to state his position. His contention was that he doubted whether any of the faults discovered in the production of ready-mixed concrete were any less prevalent in the manufacture of site-mixed concrete. Cement, water and aggregate quantities are ultimately the responsibility of the purchaser, Mr. Walker observed—if someone wants to buy a 3-bag mix, someone will sell it to him.

Steel Formwork

L. A. Wagner, director of engineering and research, Missouri Portland Cement Co., St. Louis, presented a talk on the advantages of steel forms for industrial concrete construction. Though Mr. Wagner admitted his chief interest was in manufacturing good cement, he became familiar with concrete placing when his company embarked upon an expansion program (see ROCK PRODUCTS, August, 1951, page 127). The many massive concrete structures in a cement plant required economical construction, and since raw material costs could not be reduced,



One of the stops on the field trip the A.C.I. members took was the Commission Row project, a wholesale produce warehouse under construction, chiefly of precast units. Wall panels are cast on the ground at the job site, then raised into place. There is a total of 3.3 miles of wall panel in this job





Left: A wall panel has just been lowered into place at the Commission Row project and workmen are preparing to weld it in place. Precast concrete joists are used for roof construction (upper right). Above: The sidewalk superintendents braved an icy wind to check construction work on the field trip

the cost of forms had to be pared. Mr. Wagner listed the following advantages of steel forms:

1. Job sites are kept cleaner and more orderly, an important factor in building in a restricted space.
2. Strength and rigidity are possible; kiln piers must be kept in alignment. Also, slurry basins up to 30 ft. diameter were made in one pour, as were wall sections 30 ft. high.
3. Rapidity of erecting and dismantling—200 ft. diameter thickeners were stripped in two days, then cleaned and oiled in another two days.
4. Neat appearance of finished concrete—no finishing or cement wash was required.

Mr. Wagner concluded his interesting talk with slides showing construction methods using steel forms. His closing remark was that the cheapest way of doing something is to do it the best way.

Continuously Reinforced Pavement

J. D. Lindsay, engineer of materials, Illinois State Highway Department, Springfield, Ill., described the construction of an experimental section of continuously reinforced concrete pavement. Movies were shown of the laying of the longitudinal and transverse reinforcing bars and of the placing of the concrete. Concrete used was 5.6-bag mix, 1½-in. slump, and all aggregate was minus 2 in. Percentage of reinforcing steel varied from 0.3 to 1.0 percent in different test sections. The test road was constructed on a compacted dry subbase, and the total cost was about equal to a slab with 6-in. granular subbase.

The six miles of pavement were laid in 1946 and 1947, and tests made regularly since then were summarized. SR-4 strain gauges were incorporated in two slabs to test reinforcing bar stresses. Only two structural failures occurred after a few months' use, and these were sections placed at the beginning of the day. This leads to the belief that poor concrete was involved, according to Mr. Lindsay. In the end, the criterion for determining the value of this type road is economic, he observed, and must take into consideration maintenance, service life and initial cost factors.

Tests on Concrete Slabs

Studies on instrumentation and strain measurements in welded wire fabric reinforced concrete slabs were described by E. W. Carlton and Joseph Senne, department of civil engineering, Missouri School of Mines and Metallurgy, Rolla, Mo. Stress distribution and proper spacing of longitudinal and transverse wires in the fabric were presented. A weld tester was designed which is being used as a production control in the manufacture of wire fabric and as a standard by users.

The technique of attaching type A-7, SR-4 strain gauges on the small diameter wire was to mold the gauge around the wire, then to cement it with Duco cement, insuring close contact by using a steel clamp with sponge rubber around the gauge. Thick rubber cement was applied in several layers to waterproof the gauge. After testing, electrician's rubber rope was wrapped around, then more coats of rubber cement applied.

Principal results of the loading test of the reinforced concrete slab was the proof that little increase in stress occurred beyond the first weld on either side of the load until the concrete had cracked at the first transverse wire. It was also determined that closely-spaced small transverse wire can definitely control transverse cracking.

The two speakers felt that cracks in reinforced concrete slabs are due mainly to one or more of the following general causes: (1) lack of adequate investigation of all the design factors involved; (2) lack of sufficient knowledge and reliable research data involved in the intricate conduct of steel and concrete when working together as a structural unit, and (3) lack of teamwork in the human element involved in advanced planning, the actual construction, and the curing of the finished structure.

Structural Design

A number of talks were given on the design of concrete structures. Raymond C. Reese, consulting engineer, Toledo, Ohio, summarized seven years' work on the compilation of safe load tables, which is being issued by the Concrete Reinforcing Steel Institute as the "CRSI Design Handbook."

Field practices in the construction of multistory concrete tanks were described by Evangelos J. Critzas, construction engineer, Borsari Tank Corp., New York, N. Y. The tanks were built for a brewery, and many of them required rough interior surfaces for facing. This was accomplished by two methods, Mr. Critzas said. The first was to coat plywood forms with a chemical which would prevent setting of the concrete immediately adjacent, then when the forms were stripped a wire brush flaked off the surface, exposing coarse aggregate. A second method was to use sandblasting. Mr. Critzas said that his company's experience with ready-mixed concrete for the tanks has been very favorable.

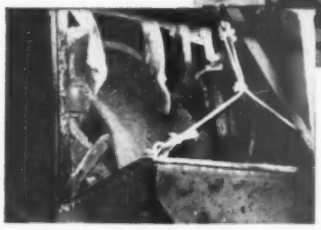
A method of expressing the effect of

(Continued on page 166)

17 Years Young and 3,100,000 Cubic Yards to show for it!



126-S Worthington-Ransome Big Mixer at Arundel-Brooks Concrete Corporation's Wolf Street plant, Baltimore, shows hardly any sign of wear after having poured 3,100,000 cu yd in its 17 years.



Worthington-Ransome 126-S discharging full 5 cu yd batch in approximately 30 seconds.



One of Arundel-Brooks' 6½ cu yd agitators pouring a retaining wall at General Sam Smith Park, being built to relieve traffic congestion at Light and Pratt Streets, Baltimore.

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And eight of the company's growing fleet of truck-mounted agitators are Worthington-Ransome Blue Brute Hi-Ups, considered "highly satisfactory in every respect."

These eight are used for most long-distance hauls because their light weight* permits carrying a maximum payload with strict adherence to highway load limits.

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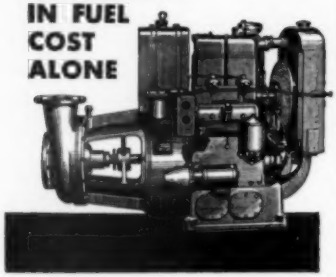
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cable tension for a post-tensioned reinforced concrete structure as a distributed or concentrated load was discussed by Robert B. B. Moorman, department of civil engineering, University of Missouri. This highly technical talk was illustrated with many slides.

The concluding design talk was presented by O. W. Irwin, president, Rail Steel Bar Association, Chicago, Ill. He gave a description of rail steel reinforcing bars and present specifications covering them. In his remarks, Mr. Irwin said that design tables in this country are just beginning to catch up to specifications in use in Germany, Sweden and Denmark with reference to the economical use of steel. This is of particular importance now, since the steel shortage is acute. A motion picture made for the association, entitled "Rail Steel in the World Today," was shown. This presented the story of rail steel, from manufacture to use to by-products.

The luncheon meeting was highlighted by a talk by A. H. Baum, St. Louis building commissioner, and chairman of the Building Officials Conference of America. Mr. Baum spoke on a subject of great interest to him, and to builders everywhere—adopting a uniform building code across the country. Much progress has been made in the last year, he said, and as fast as all major code writing organizations accept recommendations, revisions will be written into the four major building codes in use in the country.

Field Trip

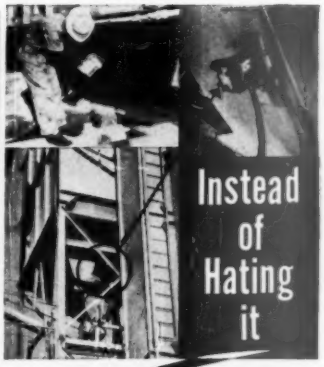
The field trip on the second day took three bus loads of members to interesting concrete construction jobs in St. Louis. Of particular interest was a produce market center consisting of two buildings, each 114 x 1225 ft., made of precast wall panels. A total of 3.3 miles of wall panels will be used, which are erected by the tilt-up method. Precast concrete floor joists are used throughout.

Social events also included a dinner, topped off with an entertaining talk by Col. F. W. Green, retired president of the St. Louis-Southwestern Railway Co.

Reinforced Concrete Pipe

UNIVERSAL CONCRETE PIPE CO., Columbus, Ohio, has issued an illustrated brochure describing the various sizes and shapes of the reinforced concrete flat-base pipe produced at its plants.

As described in the brochure, the pipe may be used upright or inverted for culverts, pedestrian underpasses, cattle passes, utility galleries and manholes and are manufactured in sections in sizes ranging from 46 x 46 in. to 97 x 97 in. The flat-base sections can be laid in new fills or jacked through old construction. Joints are tongue-and-groove and can be made watertight by use of rubber gaskets. A conveniently located lifting hole facilitates handling and positioning.



Start Vibrating It!!

. . . With Cleveland Air vibrators, like the Type LSRR and F_3 shown at work herewith.

It's easy to just get mad and say what's the use, but it's a lot easier to let these twins shake it loose.

They are double troublemakers for your double-tough materials. They're doing a round-the-clock job in a lot of plants like yours.

The LSRR is equipped with a cast steel male bracket which fits the female bracket that is standard equipment on most covered hopper railroad cars. Easily adapted to hoppers, bins, chutes, flasks, mine cars, etc.

The F is made in six sizes for bins containing from one to several hundred tons. The F will call a halt immediately to arching, plugging, and sticking. As shown, simply mount the vibrator on the skin of the bin, using a reinforcing plate. Type JN lever-type valve and automatic lubricator insure efficiency. Catalog No. 105 gives further detail.

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Concrete for Ohio Turnpike

THE OHIO TURNPIKE COMMISSION recently announced that it has adopted a recommendation by the consulting engineers for the turnpike project that portland cement concrete be used instead of asphalt paving.

The 241-mile toll road which will extend from the western extension of the Pennsylvania Turnpike now under construction, to the Indiana state line, will cost approximately $300,000,000 and will require about 5,500,000 bbl. of cement and 200,000 tons of steel.

Concrete Roof Tile

BESSER MANUFACTURING CO. of Alpena, Mich., has announced that two installations in the United States have been equipped with the Besser-Anza fully automatic concrete roof tile machine and auxiliary equipment, to produce up to 24 concrete roof tile per minute of any desired color.

These installations are both in Florida; at Maule Industries, Inc., Miami, and Cement Block, Inc., Tampa.

Material used for tile manufacture is ordinary sand and gravel of proper gradation, handled by conventional concrete block plant methods. The sand and gravel are mixed with cement and water in a Besser batch mixer to proper consistency and conveyed to the tile machine where the mixture is agitated, compacted, formed, trimmed and sprayed to any desired color. The tile are then removed from the machine, racked and transported to a curing room.

The Besser company claims many advantages for its product over any concrete roofing tile manufactured today by any other process.

First, the method of manufacture compacts the concrete, thereby producing a dense structure which increases the strength and decreases permeability, making a unit impervious to water.

Secondly, the design of the tile is interlocking all four ways and has a weather check at the upper end under the overlapping tile, producing a barrier to any water that may be driven under the tile during a rain storm.

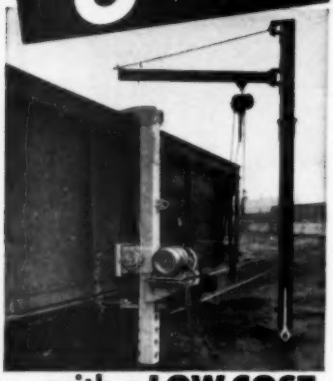
Thirdly, the company's coloring process is reported to produce a brilliant color of lasting quality, irrespective of weather conditions. This is accomplished by grinding inert oxides of proper color into the cement, by mixing into a water slurry and automatically spraying the tile immediately after its forming, thereby curing the color and concrete together to form a permanent bond between the two.

It is felt that this tile is not restricted to Florida or the southern section of the United States but, due to its design and methods of manufacture, will receive national acceptance.

Regarding procurement of this equipment, it is available under a Use Agreement Plan similar to that of the Besser block machine.



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Shaker can be quickly moved from car to car.



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DRAIN TILE MANUFACTURERS MEET

W. E. Dunn Manufacturing Co., Holland, Mich., was host to a meeting of the Michigan Drain Tile Manufacturers' Association on October 30. The meeting was an excellent one and well attended. Among the 60 persons registered were some 40 producers of drain tile including several from out-of-state, the balance including representatives from the Portland Cement Association, Michigan State College, the University of Minnesota and the tradepress.

Registration was at the Dunn Manufacturing Co. plant where company officials conducted the delegates through the equipment manufacturing operations and put on an interesting demonstration of the manufacture of various concrete products. Among the demonstrations were the manufacture of units on the Champion drain tile machine which is equipped with an automatic feeder, the Hydro-Korpak block machine, the Cavitex machine and the Duntile machine. The Colorcrete process in the application of a variety of colored facings and textures was applied to concrete masonry units in an effective demonstration. Methods for testing concrete tile and aggregate analyses were also conducted.

After completion of the demonstrations the group adjourned to the Warm Friend Tavern in downtown Holland for an afternoon session. J. G. Martin of the Portland Cement Association, Lansing, Mich., presided at the meeting. Following introduction of special guests and top officials of the Dunn Co., Prof. Philip W. Manson, from the Division of Agricultural Engineering, University of Minnesota, presented the feature address on the subject "Production of High Quality Drain Tile."

Quality Is Important

Professor Manson has had some 26 years of experience in the field of drain tile and has published considerable material on the subject based largely on research studies conducted over the years in efforts to improve the quality of drain tile in Minnesota. Throughout his talk, he stressed the extreme importance of manufacturing and curing tile so that they will be durable regardless of the soil conditions encountered. His was a plea for quality concrete supported by facts and figures to prove that high grade tile can be made that will outlast inferior tile by many years.

Principal causes for drain tile failures were listed as overloading and the effects of either alkaline or acid soils. These conditions have been encountered and studied intensively throughout Minnesota and are known to exist in other areas. In leading into a discussion of these factors, Professor Manson warned that poor performance of drain tile anywhere is injurious to the entire industry and he reminded that there is a lot more to the problem of obtaining good durability than just the manufacture of the tile on a machine. His talk was illustrated by slides to show the kinds of failures attributable to the several causes discussed.

A nomograph was shown and explained for determining the loads on pipe in trenches as was a chart showing the allowable maximum depths in feet for tile of common sizes and for various trench widths. Copies of this material were made available to those in attendance as were copies of reprinted articles and studies bearing on the durability of concrete drain tile.

The trend in recent years to the use of heavy earth-moving equipment like power draglines and trench hoes has focused attention on the need for more knowledge of stresses encountered and the data presented brings knowledge of accepted practice up-to-date.

Professor Manson called attention to the fact that the most recent specification of A.S.T.M. establishes standards for "extra quality" and "standard" drain tile which designate 1200 p.s.i. per running foot as the requirement for lowest quality tile and 1600 p.s.i. for extra quality. Extra quality tile are required where heavy cuts are necessary and there may be a need for extra heavy thicknesses of walls or reinforcing under certain circumstances.

Effect of Alkali and Acid Soils

Alkali soil conditions are prevalent in Minnesota and are now being recognized in parts of Michigan as well as in other areas. The action of alkalies (magnesium or sodium sulfate) is severe on concrete, resulting in a chemical change to calcium sulfate with great volume change which is disruptive. The problem of resistance to alkali action has been studied for many years and some 100,000 cylinders and 10,000 tile have been tested using different cements, admixtures and other variables. The work at Medicine Lake, S. D., where specimens have been submerged for various periods of time in a 14 percent alkali water was mentioned. Some concrete specimens were short-lived while others have endured well.

These studies have revealed that the chemistry of the cement used is of great importance. Professor Manson called attention to the differences in ability to resist alkali reaction among the various cements and he strongly recommended the use of sulfate-resisting cements for tile to be used in alkali soils. The use of high temperature steam in curing will have an immunizing effect.

Acid soils result in etching of the cement away from the aggregate particles and the best defense against this

action is the manufacture of high strength, low absorption tile. Slides were shown to point out the great differences in performance between dense concrete tile and others of lower quality. They showed that where low-grade tile might endure for 6-8 years in pH's of 5 or 6, higher quality might be expected to last 30-80 years under the same exposure. The action of acid cannot be stopped but can be slowed down markedly through use of dense concrete.

Manufacturing Recommendations

Professor Manson suggested that the following steps be followed in manufacturing quality drain tile: (1) careful selection of aggregate; (2) consultation with experts from the colleges or Portland Cement Association on mix design; (3) use of plenty of coarse material in the aggregates, at least 40 percent retained on the No. 8 seive and half of that retained on the No. 4; (4) use of a rich mix with a minimum ratio of 1:2.5-1:3; (5) use of generous quantities of mixing water to insure complete hydration of the cement; (6) recognition that the machine alone cannot be depended upon for a quality product; (7) curing by steam at 125-135 deg. F. for the first day after manufacture, or if steam is unavailable, watering down in stock.

Great emphasis was placed on adequate curing since alkalies or acids have serious destructive effects on green concrete. In cold weather areas, steam curing for two days prior to stockpiling was recommended. In conclusion it was pointed out that quality of product is essential to keeping pace with competitive products. Clay tile are not seriously affected by alkalies or acids, although they are susceptible to the effects of freezing and thawing.

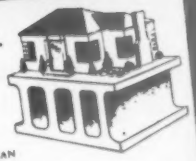
At the conclusion of the session, a chicken dinner was served and the day's activities concluded with a business session under the chairmanship of president Russel V. Smith, president of the Michigan Drain Tile Manufacturers' Association.

Stone Exposure Test Wall

THE NATIONAL BUREAU OF STANDARDS recently issued Building Materials and Structure Report No. 125, entitled "Stone Exposure Test Wall." The exposure test wall was built in connection with a long-time project to study the action of various weathering agents affecting stone masonry. The project is a cooperative investigation between the National Bureau of Standards and Committee C-18 on Natural Building Stones of the American Society for Testing Materials. The report sets forth problems on weathering, discoloration and certain construction features. Copies may be obtained for $0.30 each from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

ONE GOCORP SENIOR LEADS TO ANOTHER

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June 5, 1951

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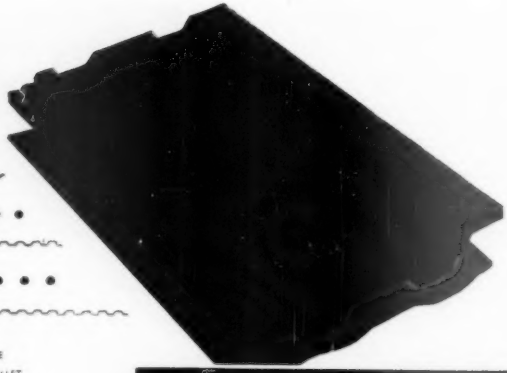
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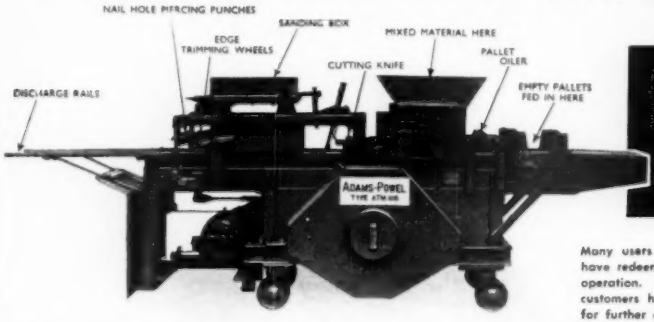
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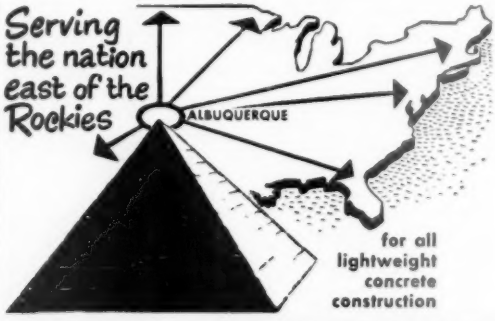
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Offered in carload lots to contractors, block plants, and ready-mix plants.

CMP-4B and 4C Applications

THE AMERICAN CONCRETE PIPE ASSOCIATION has advised its members to give special and immediate attention to the filing of the CMP-4B form for obtaining steel. Accompanying the form should be a letter outlining in detail the projects for which the steel is needed, including the sponsor of the project such as Army, Navy, state highway department, etc., the nature of the project, the contract number, ratings assigned to projects, and any other information which would support the member's right to that steel. The importance of this was stressed because, as stated by A.C.P.A., there isn't enough steel to go around and what steel there is will go to the most deserving projects.

Another point brought out by A.C.P.A. concerned the filing of CMP-4C. The industry's customers, such as municipalities, highway departments, government agencies or private industry, who must file CMP-4C applications for approval to construct projects, should not include the steel for pipe reinforcing as a part of the controlled materials they request. The steel they request should only be that required for structures or for reinforcing concrete to be placed on the job.

Concrete pipe manufacturers can only obtain authorization to buy steel for pipe reinforcing as a result of their CMP-4B applications to the Building Materials Division.

Members were further advised that when a customer files a CMP-4C application, the correct procedure for him to follow is to fill in the amount of all steel needed for all purposes *except* for pipe and other "B" products. The application should be accompanied by a letter describing the "B" products which will be required. For concrete pipe, it was suggested that the sizes and quantities as well as class or type of pipe required be included. This letter should also clearly substantiate why the project must be done now. If defense industries, airports, defense housing, military or atomic energy projects are to be served by the new facilities, this should be stated and descriptions of them given, along with letters of support from the proper authorities. This information will aid the Government Claimant Agency in Washington with whom the CMP-4C is filed, in determining the necessity of the project and seeing that the concrete pipe industry is allotted the necessary steel to manufacture the pipe required.

CMP-4B deals only with reinforced pipe. Applications must be filed for each quarter. The allotments already received for the first, second and third quarters are only tentative and they do not obviate the necessity of filing a CMP-4B for each quarter. If less than 100 tons material per quarter are needed, the application should be filed with the local or regional office and an



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This steadily-rising sales curve (or trend) clearly reflects consistently-lowered materials-handling costs effected by Clark machines. The fact that more and more Clark machines go into the hands of more and more satisfied customers every day is your positive assurance of Clark's superiority.

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X3 rating will be issued; if over 100 tons are needed, the application should be filed with the Washington office and a K7 rating will be issued.

Concrete Conference

THE ENGINEERING DIVISION of the University of California, in cooperation with the Los Angeles Chapter of the General Contractors of America, the Portland Cement Association and the American Concrete Institute and local members of the concrete industry of the Pacific Coast, held a conference on practical concrete problems, in Los Angeles, Calif., October 26.

The conference, a nontechnical discussion of concrete problems, was led by a panel, including M. Erick, consulting engineer; C. A. McMahon, technologist; C. D. Wails, contractor; S. Hobbs, field engineer, Portland Cement Association; and J. W. Kelley, professor of civil engineering, University of California. A similar conference was held in San Diego, Calif., October 25.

Judgment Sustained

PRE-SHRUNK MASONRY SALES CORP., Roanoke, Va., which had filed damages of $750,000 against two construction companies for losses suffered in the collapse of a bin structure at its cinder block plant, was awarded a judgment of $199,625 early last summer. The case was recently reviewed

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H. A. Milton





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PORTLAND CEMENT

in Law and Chancery Court after the counsel for the plaintiff moved that the verdict be set aside on the ground of inadequacy and the defendants also sought to have the verdict set aside and the action dismissed. However, the earlier judgment was affirmed in Law and Chancery Court and the case has been stricken from the docket. Another suit for $15,000, growing out of the death of a Pre-Shrunk Masonry Sales employe when the mixing hopper collapsed, is now pending.

Concrete Pipe Advisory Committee

THE AMERICAN CONCRETE PIPE Association has given the following report of the meeting of N.P.A. officials with the industry advisory committee of the concrete pipe industry, held recently in Washington.

The advisory committee made many recommendations and suggestions to N.P.A. concerning various phases of the industry. Among them was the recommendation that orders for steel for concrete pipe to be used in prime contracts be given the same priority rating as the defense project itself to avoid delays in the construction of important military and atomic energy projects. It also recommended that an amendment be issued to Direction 3 of Order M-1, which establishes specific rules for the placement, acceptance and scheduling of orders for steel projects. Orders for steel now must bear the authorized controlled material (ACM) rating K-7. Under the committee proposal, they would also bear the A, B, C or E rating assigned to the agency handling the defense contract. The committee reported that important defense projects are being delayed because the concrete pipe industry has been unable to get steel mills to accept orders for steel for reinforced concrete pipe. N.P.A. agreed to consider the recommendations.

The committee also pointed out that 50 to 60 percent of reinforced pipe currently being produced is for the defense program and that government specifications for this type of pipe call for amounts of steel twice greater than required for normal commercial use. Since pipe has been classified as a "B" product, this imposes a heavy burden on the industry which it cannot bear and simultaneously fulfill its defense contracts. One committee member stated that his company was reaching the point where it could not bid on defense contracts because it could not get the necessary steel for reinforced concrete pipe.

N.P.A. advised the committee that the industry can look forward to a 10-15 percent decrease in orders for concrete pipe for non-defense programs and for a substantial increase in orders for defense projects. It was also revealed that gasketing and sealing compounds used in the manufacture of concrete pipe will have to be made of synthetic rather than natural rubber in the future, due to the tight supply of natural rubber, but the committee was assured that there would be no shortage of gaskets for the industry. The committee reported that synthetic rubber gaskets have proved highly satisfactory.

N.P.A. also announced that there will be an expansion of cement production in 1952, which will far surpass the figure of 226,000,000 bbl. of cement produced in 1950 and also the 1951 figures which will surpass the 1950 output.

Another item was the committee's unanimous approval of the recommendation made by the Wire Reinforcing Mesh Industry Advisory Committee for standardization of wire mesh sizes. More than 100 different sizes of wire mesh are now being made.

After the first of the year, wire mesh is to be a controlled material instead of being classified as a "B" product. It is expected that after that time, wire mesh will be obtainable under a more normal arrangement without the long back-log of unfilled orders and the unfairness of distribution which has been experienced in the last two quarters.

Vacuum Concrete

THE FIRST INTERNATIONAL CONGRESS on Vacuum Concrete Processes, recently held in Paris, France, was attended by delegates from 14 countries. Among the delegates attending the congress was K. P. Billner, president of Vacuum Concrete, Inc., Philadelphia, Penn.

The large attendance at the congress was said to be indicative of the increasing acceptance of the vacuum concrete methods, particularly in precasting. With the control inherent to precasting, strengths of 7000 p.s.i. may be easily obtained, which is more than twice the average strength of cast-in-situ concrete, according to Mr. Billner. Lighter sections of equal strength, savings in reinforcing steel and cement, elimination of the use of form lumber and savings in time, are advantages claimed for the precast vacuum concrete.

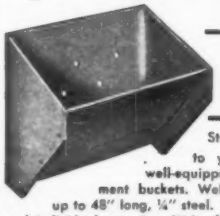
A pamphlet "Vacuum Concrete All Over the World" written by K. P. Billner, shows samples of vacuum concrete construction outside the United States. The illustrations include: a four-story precast housing project in Egypt; large concrete pipe for high water pressure, without the use of a steel membrane, in Italy; large-diameter, high-strength, concrete pipe, with thin wall section and no reinforcement, made in Spain; precast tanks made in South Africa; and low-cost, precast houses with a thin, light, Ortega-Billner roof, of which hundreds are now being built in Columbia.

Concrete River Weights

UNIVERSAL CONCRETE PIPE CO.'s Nashville, Tenn., plant recently received the largest order of reinforced concrete river weights in the company's history. The order, which included 1700 special-type units, was placed by Texas Gas Transmission Corp., Owensboro, Ky., for use on its pipe lines in Louisiana, Mississippi, Tennessee and Kentucky.

The large weights are being produced in halves, with crane and hoist hooks to simplify handling. When the halves are bolted together over sections of pipe, they form a 5100-lb. anchor that prevents the line from shifting. Weights are manufactured in sizes ranging from 12 to 26 in., inside diameter. A brochure, "Hold That Line," gives product details.

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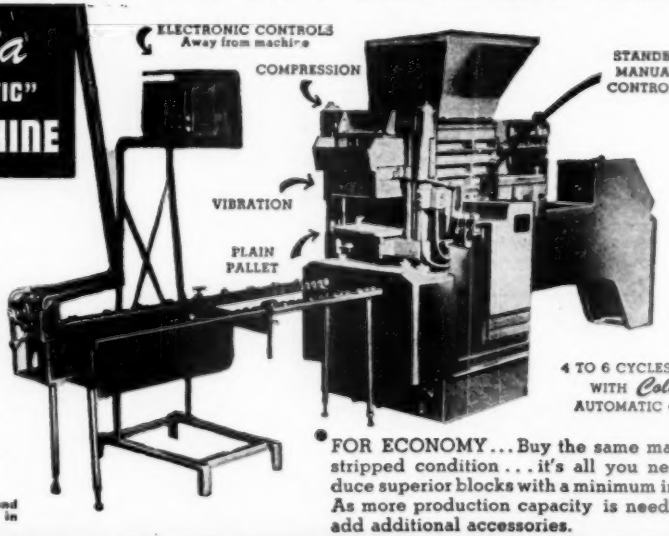
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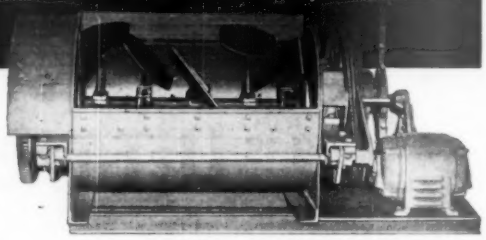
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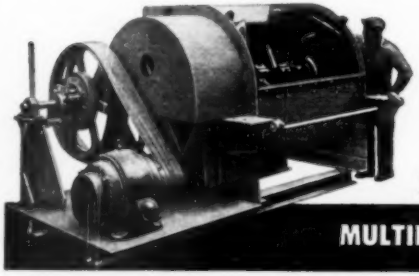
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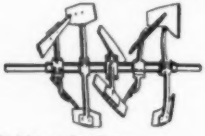


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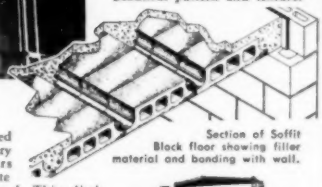


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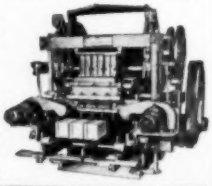
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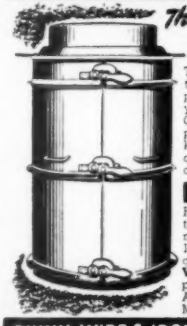
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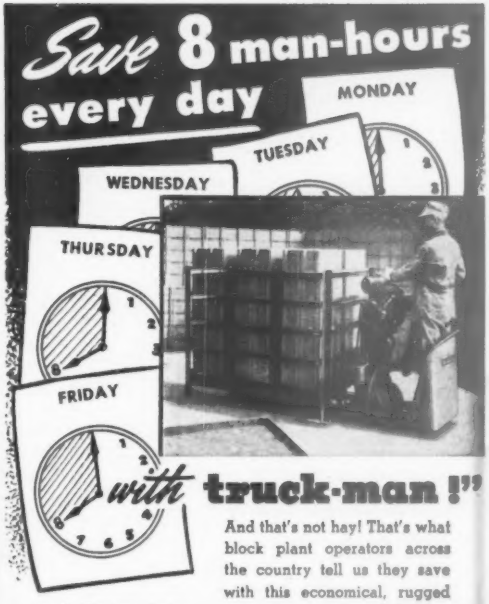
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1—Dunbrik Machine with motor and transmission complete #CDB-37
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New—Ready To Use!
40,000 BTU capacity

— Burning gasoline, kerosene or diesel fuel.
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1—Kwik-Mix 16S mixer with tower loader
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1—8" Mold Box with 8000 Cast Iron Pallets
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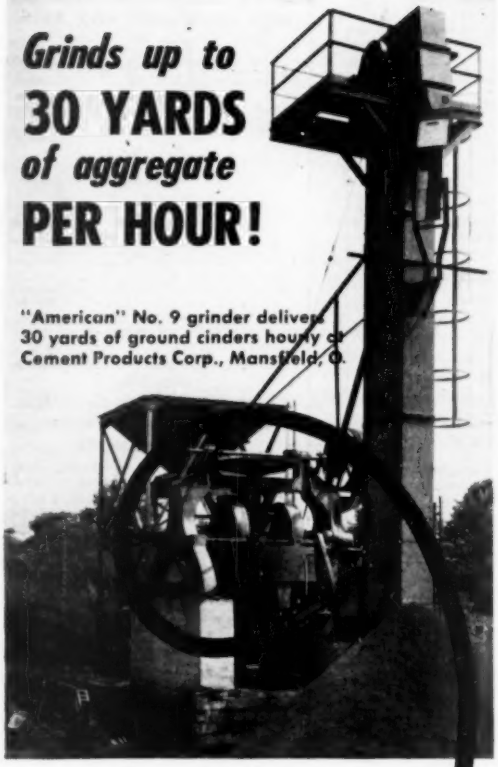
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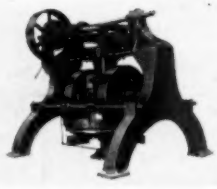


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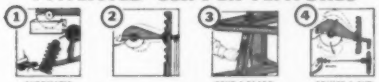
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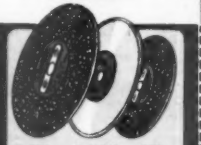
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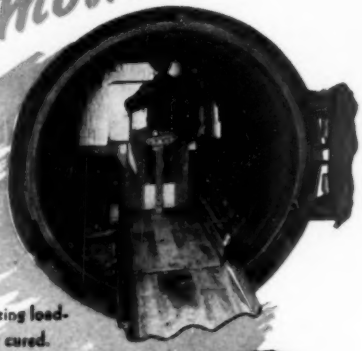
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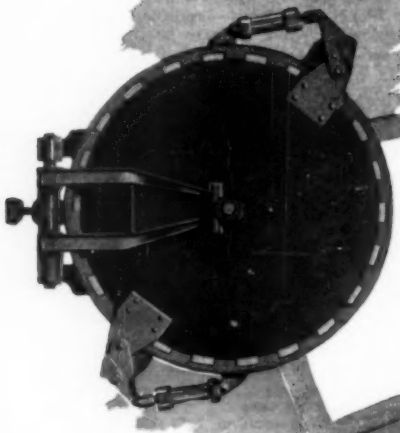
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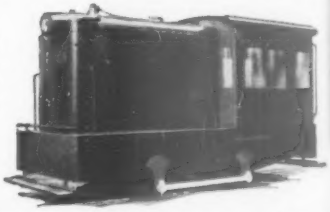
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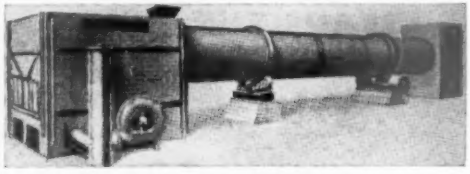
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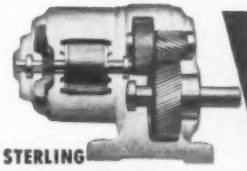


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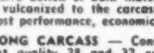
We have 8 to 48

RUBBER CONVEYOR BELTING

TOUGH COVERS—Heavy duty, specially compounded abrasive resistant rubber covers having high tensile strength. Thoroughly capable of withstanding the abrasive action of bulk materials. Properly vulcanized to the carcass to assure utmost performance, economically.

STRONG CARCASS — Constructed of finest quality 28 and 32 ounce tough cotton duck, properly treated and impregnated to avoid mildew from moisture and atmospheric conditions. Each ply thoroughly embedded in rubber to prevent ply separation.

FLEXIBILITY — Careful attention has been given in the construction of all belts to have the proper flexibility assuring the following desirable features; troughs easily, runs true on all idlers, gouge resistant, excellent for long and short hauls and slope installations.



Avoid delays in your production schedules!

We carry in stock for your immediate requirements, Conveyor Belting in widths from 8 inches to 48 inches.

Width	Ply	Thickness Top Cover	Thickness Bottom Cover	Type of Duck Carcass
8"	4	1/16"	1/32"	28 Oz.
10"	4	1/16"	1/32"	28 Oz.
12"	4	1/16"	1/32"	28 Oz.
14"	4	1/16"	1/32"	28 Oz.
16"	4	1/8"	1/32"	28 Oz.
18"	4	1/8"	1/32"	28 Oz.
20"	4	1/8"	1/32"	28 Oz.
20"	5	1/8"	1/32"	28 Oz.
24"	4	1/8"	1/32"	28 Oz.
24"	5	1/8"	1/32"	28 Oz.
26"	5	1/8"	1/32"	28 Oz.
30"	4	1/8"	1/16"	32 Oz.
30"	5	1/8"	1/16"	32 Oz.
30"	6	1/8"	1/16"	32 Oz.
36"	6	1/8"	1/16"	32 Oz.
42"	5	1/8"	1/16"	32 Oz.
42"	6	1/8"	1/16"	32 Oz.
48"	5	1/8"	1/16"	32 Oz.
48"	8	1/8"	1/16"	32 Oz.

INQUIRE FOR SIZES NOT LISTED. ELEVATOR TRANSMISSION & V-BELTING ALSO IN STOCK

All our belting made by the leading belting manufacturers.

Write for Free Booklet on Installation, Care & Maintenance of Conveyor Belting.

SEND US YOUR INQUIRIES FOR OTHER RUBBER PRODUCTS.

CARLYLE RUBBER CO., Inc.
62-66 Park Place, New York 7, N. Y.
Phone: Digby 9-3810

DRAGLINE FOR SALE

(1) PAGE STEAM DRAGLINE MACHINE, OUR No. 117. 160 TON —100 Ft. BOOM. 11" x 12" ENGINE. AS IS, AT OUR PLAINFIELD, ILL. PLANT $8000.00. WITHOUT BUCKET. DISMANTLING, LOADING AND TRANSPORTING TO BE PAID BY PURCHASER. MACHINE NOW WORKING AND ITS CONDITION FAIR TO GOOD. SUBJECT TO PRIOR SALE.

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FOR VALUES — "BUY" BRILL

1—Raymond 3 Roll High Side Mill, oil journals, whizzer, fan, cyclone, piping, tubular collector.

1—Raymond 3 Roll Midget High Side Mill, oil journals, whizzer, fan.

2—Keeler 125 HP Water Tube Boilers, ASME, 160# pressure, with stokers.

2—8' x 125', 8' x 110' Rotary Kilns complete with drives, etc.

3—7' x 60', 5' x 67', 4' 6" x 40' Rotary Dryers.

2—Ruggles-Cole 70" x 45', 70" x 35' Rotary Dryers.

6—Tyler Hummer 4' x 7', 3' x 5' Single and Multiple Deck Screens.

12—Bucket Elevators 34' to 90' centers, 8" x 5" to 24" x 8" buckets, steel encased.

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M-M "RTI" Used Ind. Tractor w/Lull Shoveloader
Henke "70" Used Maintainer, 10' Blade, Hyd. $1250.00

CRANES and SHOVELS

Bay City "30" ½ yd. Used Diesel Shovel $4500.00.
Insley "K-12" ½ yd. Used Drag, $4500.
Quick-Way "J" ¼ yd. Hoe or Dragline mounted on White Half Track. Used.

PAVERS and MIXERS

Rex "27E" Paver, Big Drum, ready to pave.
Smith 3 yd. Used Hi-Discharge Transit Mixer, w/o Truck.

EIGHMY EQUIPMENT COMPANY
120 S. Pierpont — Rockford, Illinois
(U. S. No. 20 West)

1—Kent Maxecon, Type No. 7 Ring Roll Mill and Drive.
1—No. 4½ Champion Jaw Crusher, 10"x20".
1—No. 6 Champion Jaw Crusher, 12"x 26", rebuilt.
1—New Holland Swing Hammer Pulverizer, 20"x10".
1—Acme Deep Frame Jaw Crusher, 24" x40".
1—McLanahan & Stone heavy duty Plate Feeder, 42"x96".
1—18" Link-Belt Apron Conveyor—9" pitch, 27' centers.
Bucket Elevators, open and totally enclosed, new and used, as is or rebuilt.

JOHNSON & HOEHLER, INC.
P. O. Box 102 — Lansdowne, Pa.

The following is a list of the structural steel we have available:

1 pc.	8" WF @ 31 lbs.	17'-1"	528#
2 pcs.	do.	18'-6"	1146#
			1674#
1 pc.	14" WF @ 53 lbs.	29'-6"	1562#
1 pc.	do.	20'-0"	1060#
1 pc.	do.	18'-6"	980#
			3602#
			5276#

This is all new unused straight steel without any holes and even still has mill scale on it. We prefer to sell it all in one lot and if it moves by truck we will load the truck. If it moves out on a railroad car, loading costs will be extra. Price—ten cents (10¢) per lb. straight.

HOVEY CONCRETE PRODUCTS CO.
P. O. Box 942
Santa Fe — New Mexico

Special Crushers !!

ALLIS-CHALMERS 42" Gyratory Crusher.
ALLIS-CHALMERS 66" x 84" Jaw Crusher.
ALLIS-CHALMERS 48" x 60" Jaw Crusher.
A-C Superior McCully 30" Gyratory with drive.
FARREL BACON 36" x 48" Jaw Crusher.
BUCHANAN Type C 36" x 42" Jaw Crusher.

SHOVELS—CRANES—DRAGLINES

P&H 255A 20 ton Truck Crane heavy duty.
Northwest No. 6 1¼ yd. Diesel Shovel.
Link Belt K580 Shovel, 1948—practically new.
Lorain L—820 Dragline 70 ft. boom.
P&H Model 655, 2 yd. Diesel Shovel.
LIMA Model 34 yd. Dragline 34' Boom. Diesel
Lima 1201, 2½ yd. Diesel Shovel.
Lorain L80 Shovel, 1¾ yd. complete overhaul.
Link Belt K-595 dragline, 2½ yds., 8 ft. boom.
Koehring 605, 1¼ cu. yd. Shovel—Diesel.
Lima 802, Shovel-Crane-Drag, 2 yd. Diesel.
Koehring ¾ yd. Diesel Shovel.

CRUSHERS

JAW: Acme 10x20, 14x26, 14x28, 10x42, 16x32, 18x32, 25x40. Eagle 20x36.
Cedar Rapids 10x20, 20x36, 25x40. Farrell 10x20, 13x30, 14x36, 18x36, 36x48. Buchanan 36x42. Good Roads Reliance 15x30. Traylor 18x36, 24x36. Allis-Chalmers 30x18. Good Roads 10x30. Telsmith 18x32. Champion 1030, 1040, 1236, 1530.
GYRATORY: Allis-Chalmers-McCully, 6", 7½", 8", 9", 12K, 20", 30", 42", 54", Newhouse, 24", 36". Gyrasphere, 18", 28". Intercone Telsmith, Telsmith 5H, 10-B, 13-B, 16-B, Kennedy Van Saun 7, 19, 25½-S, 37, Traylor Ty 1'8", Ty 2'4", T-4½".
ROLL: Allis-Chalmers 54x24. Diamond 40x22. Pioneer 30x18. Telsmith 24x16. McLanahan & Stone 18x42; 36"x18". New Holland 24x16.
HAMMERMILL: Size 4 Williams Jumbo, Pennsylvania SX2, 22x22. Cedar Rapids 20x33. Jeffrey 36x42. Jeffrey 36x36, 30x40. Dixie 3650.
BALL MILL: Allis-Chalmers 4'x4', 5'9"x18'. Kennedy Van Saun 7'x5'. New 6'x6'; Hardinge 6'x4'; Colorado Iron Works 5'x6'; Marcy No. 64½.
ROD MILL: March 2'x6', 3'x6'. Allis-Chalmers 4'x8'. Hardinge No. R 206.
CONE: Symons 2' coarse bowl, 3' short head, 4' standard coarse bowl.
TUBE MILL: Smith 16B 5'6"x20', Denver 3'x8'.
DRIERS: McNeil 5'x50'. Hardinge 90"x60'. Cummer 66"x50'. Perkins 8'x70', 10'x90'.

SCREENS AND FEEDERS

Telsmith 84" x 12' super scrubber, Motor drive.
Symons 4' x 10' 3 deck.
Diester 4' x 10' 3 deck.
Tyler Hummer 3' x 8' with motor generator.
Acme 5'x12' Revolv. Scrub-Scalp Screen.
Pioneer 4'x10' Scalping Screen, New 1946.
Robins 4x14 Vibrex Double Deck Screen.
Traylor Apron Feeder 5' x 45', heavy duty.
Reciprocating Feeder 4' x 10', with motor.

TRANSIT MIXERS

4 yd. Ransome on K-11 Int.
4½ yd. on L-210 Int. New '48.
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3 yd. Ransome on Mack truck.
3 yd. Jaeger on Mack Truck.

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Sauerman slack line 1¼ yd.; electric 90' mast.
Sauerman 3 yd. cableway with 125 HP electric.
Sauerman 1½ yd. 70' mast. 150 HP Elec. Hoist.
Sauerman 1 yd. with Waukesha gas hoist.

TRACTORS

3—Cat. D8 Ser. 2U with bulldozer DDPCU.
3—Cat. D7 with bulldozer DDPCU.
Int. TD 9 ¾ yd. bucket loader and 8' bulldozer.
Int. TD 14 with 2 yd. Hough loader.
Cat. D6 with hydraulic bulldozer.

AIR COMPRESSORS

C-P 500 CFM Diesel portable.
C-P 500 CFM stationary 75 HP motor.
I-R 500 CFM Diesel portable.
Sullivan 210 CFM Diesel portable.

READY-MIX CONCRETE PLANTS

B-K, 460 bbl. cement; 125 ton 3 comp. agg. bin.
Butler 3 comp. agg. bin; with 3 yd. weigh batcher.
Erie 492 bbl. cement bin, 160 yd. agg. bin 3 compt.
F-S agg. bin, 150 yds. 3 compt. with batcher.

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Pioneer 154V Crushing and Screening complete.
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Iowa Model 2A Crushing and Screening.
Universal 800 Crushing Plant, portable on pneu.
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Cedar Rapids Two Unit Mobile Crushing.
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Morris 10" elec. with cutter. Steel hull—49'x9'x5'.
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8" Hydraulic, Diesel. On 32'x8' steel pontoons.
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6" portable Diesel complete with cutters, etc.
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Custom built 15-ton stiff leg 110' Boom.
Lambert 25 ton Guy derrick 115' bm.
American Terry 20 ton Guy Derrick 100' bm.
American Terry 20 ton stiff leg with hoist.
American 25 ton stiff leg derrick 90' boom.
Special 35 ton stiff leg derrick 100' boom.

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Dings 30" x 24" complete with exciter. Excellent.

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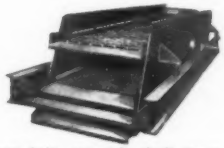
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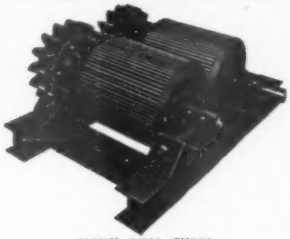
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Flat belt type bulk material conveyors. Any length, belt widths to 48". Prices from $726.00

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MANY ROLL TYPES

10 to 20 tons per hour capacity $ 479.00
25 to 50 tons per hour capacity 1144.00
Both complete with hopper

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15 Ton Truck Scales $495.00
20 Ton Truck Scales 561.00
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Others to 50 ton capacity. All scales complete with structural steel weighbridge.

Parts and weighing beams for most makes of motor truck scales.

More than 3000 mines and quarries have modernized with Bonded equipment.

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7'8"x11'6"x17'3" (2).
8'x8'x14' with U bottom (2).
4'x5'x30' (2).

BUCKET ELEVATORS

70'6" centers, 8"x5" buckets.
64'3" centers, 10"x6" buckets.
60' centers, 8"x6" buckets.
50'6" centers, 8"x5" buckets.
44' centers, 10"x6" buckets.
40' centers, 6"x4" buckets.
38' centers, 10"x6" buckets.
36' centers, 10"x6" buckets.
34' centers, 10"x6" buckets.
32' centers, 6"x4" buckets.
30'8" centers, 6"x4" buckets.
29' centers, 6"x4" buckets.
23' centers, 8"x5" buckets.

CLASSIFIERS

Dorr, duplex, 4'x20'.
30"x15' Flight Separator.

BELT CONVEYORS (Troughing)

104' centers, 10" wide belt.
24' centers, 10" wide belt.
13' centers, 10" wide belt.
56' centers, 16" wide belt.
37' centers, 16" wide belt.
475' centers, 18" wide belt (2).
70' centers, 18" wide belt.
29' centers, 18" wide belt.
26' centers, 18" wide belt.
13' centers, 18" wide belt.
96' centers, 30" wide belt.
50' centers, 42" wide belt.
Peck Carrier, 476' long, buckets 30"x36".

KILNS, COOLERS, DRYERS

11'6"x35' Roto Louvre.
4'x16'x$\frac{3}{8}$" shell, welded portable.
4'x25'x$\frac{5}{16}$" shell, welded.
4'x34'x$\frac{3}{16}$" shell, welded.
6'x14'x$\frac{5}{16}$" shell, welded (2 NEW).
5'x67'x$\frac{3}{16}$" shell.

MILLS, PULVERIZERS & CRUSHERS

16"x40", three roll.
22"x12", four cage.
Four cage, Stedman.
Size B, Abbe.
No. 3. Williams.
36"x24", Jeffrey.
40"x14" 2-roll, Traylor.
18"x36" Jaw, Traylor, Bulldog.
48" Symons vert. Disc Crusher.
6'x8' Patterson Ball Mill.
6'x8' Abbe, style GPH Ball Mill.

TANKS

15,000 gal. 9'x32'x$\frac{3}{16}$".
2,100 gal. 9'x3'6"x$\frac{3}{16}$" (2).
1,600 gal. 8'x7'x$\frac{3}{16}$" (2).
1,100 gal. 5'x7'8"x$\frac{1}{4}$".

TANK CAR TANKS

6,500 gal. 76"x27'10" (30).

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Welded
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Supplies of Fittings
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SPEED-LAY Pipe System
Quick Assembly
Economical, Light Weight.
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PIPE SUPPLY CO., INC.
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BRAND NEW

No. 420 General Crane
(Air operated — Caterpillar Diesel)
Equipped with:
1 No. 10E Pettibone digging clam shell (1 yd.)
1 Standard Rehandling clam shell (1 yd.)
Fair Lead with 115' Drum Logging
10 ft. Boom section (Total boom—50 ft.)
20 Ton Hook block assembly
Total Price $29,000.00 f.o.b. cars Hialeah, Florida

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1—Link Belt Dragline Model K-480, 2-yard.
1—Osgood Dragline, Model 1007, 2½ yard.
1—Marion Dragline, Model 40A, 3-yard.
1—Marion Shovel, Model 111-M, 3½-yard.
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6" x 3" to 60" x 48"

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Machine Shop Facilities
FEEDERS, Conveyors, Screens, etc.
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One twenty foot 12" belt conveyor all steel welded. New belt used very little $300.00, without motor $350.00 with one horse 3 phase 220 Volt motor. One 3-phase ¼ horse gear head motor, perfect condition $40.00. 50 revolution output shaft.

Marshall & Wolfe Concrete Products
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A BARGAIN

80 B Bucyrus electric 440 volt shovel. 2½ yd. capacity, 48' boom, 32' dipper sticks. Ohio location.

Box K-4 ROCK PRODUCTS
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Insleys — Lorains — Byers — Units

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Lima — NW 25 — Linkbelt —

(As is) or reconditioned.

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Belt, Bucket, Drag or Gravity
Shaker & Vibrating Screens
Truck Scales Crushers
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THE INDUSTRIAL EQUIPMENT CORP.
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2 Ingersoll Rand Compressors, 354 cu. ft. Direct driven diesel.

Box K17 ROCK PRODUCTS
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CRUSHERS: Gyratory 20", 36", 42", and 48". Nos. 12, 10, 9, 7½, 6, 5 Allis-Chal. and others.
JAW TYPE: 24x36, 22x60, 22x36, 40x48, etc.
CONE TY: Symons 2, 3, 4 and 5½'. No. 88 Telsmith. Also Kennedy 10, 35, 37 and 49. Traylor 1¾" and 2½" TY. Newhouse 7, 10 and 14". Steadman 24, 30 and 36" Impact. Allis-Chalmers Ty. B.
ROLLS: Allis-Chal. 72x30, 54x24, 54x30, 40x15 and 18x10. Pioneer 18x30. Universal 16x24. New Holland 24x16 and 16x16. McLanahan 18x24 and 18x30.
HAMMERMILLS: Williams No. 2, 3, 4 and 6 Dsl. Nos. 40 and 70. Gruendler 2XB and 3XB. Dixie 2040, 3050 and 5040, and others.
MILLS: Hardinge 3'x9", 6'x22", 8'x9" and 8'x4'. Kennedy 4x8, 5x8, 5x11. Marcy 4x5, 6x4, 7x16. Raymonds, Sturtevants and others.
CRUSHING PLANTS: 24x36, 32x40, 20x42 and smaller. Also complete stationary plants.
DRYERS: 60"x60', 7'x30', 10'x30', 8'x50'. Etc.
SCREENING PLANT: Large modern plant new in 1946, priced at 1/3 original cost.
DRAGLINES: Page 6 yd. 160' Bm.; Page 6 yd. 125' Bm.; 5W Monighan 5 and 7 Yd. 125'.
BINS & BATCHERS: 20 yd. capacity & larger

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Barges, Bins, Buckets, Boilers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryer, Derricks, Elevators, Excavators, Generators, Hoists, Kiln, Draglines, Drag Scrapers, Dredges, Drills, Engines, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Scales, Screens, Shacklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices. (I have equipment at many points in the United States and Canada. What you need may be near your plant.)

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SCREEN 4 x 12' Triple Deck Vibratory.

JAW CRUSHER 15 x 40" Roller Bearing in excellent condition.

BOOMS for 80D Northwest. One Crane Boom 65', and one Dragline Boom 75' with 2½ yd. bucket.

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Guaranteed Rebuilt.
MOTORS—GENERATORS—CONTROLS
NOW IN STOCK
We buy surplus equipment.

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1—70 HP Marine type diesel engine, Link Belt Pan Conveyor 36" x 22' centers, Fuller Clinker Cooling equipment for 10' kiln.
50 Pounds of Commercial Grade Mercury.

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1—No. 16 Allis-Chalmers Gyratory Crusher. In use. $2000.00.
1—No. 4 Gates Gyratory. Fair operating condition. $500.00.
50—Williams Jumbo Jr. hammer-mill hammers. $6.00 each.
1—110 ft. Ingersoll-Rand Compressor and Jack Hammer. Good condition. $850.00.

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2—Bradley Junior Hercules mills, used only short time. First class operating condition. $5000 each.

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One Austin-Western Model 101 Portable Crushing Plant. A-1 condition. Equipped with 4 x 12 2½ Deck Seco Screen; 10 x 36 jaw crusher; 30 x 18 roll; mounted on 1000 x 20 tires. Conveyors, bins, chutes. Ready for operation. Less than two years old. LESS THAN ONE-HALF NEW PRICE.

Clement Bros. Co., Inc.
Lenoir, N. C. — Telephone 1800

Large Pioneer Plant w/20x42 BB JAW Crusher. Also Cedar Rapids 40 TPH portable.
CRUSHERS: 10x36 Pioneer, 15x24 Austin W. 18x32 Telsmith, 24x36 Diamond, 36x48 Farrell, 60x48 Allis C JAW. 322R Allis, 7" Newhouse 30" McCully GYR. 2, 3 & 5½" Symons CONE. 40x22 Diamond DBL ROLL.
Raymond & Williams 4 & 5 roll high side MILLS. Belt Conveyors: 42"x1000', 24"x40', 12"x20'.
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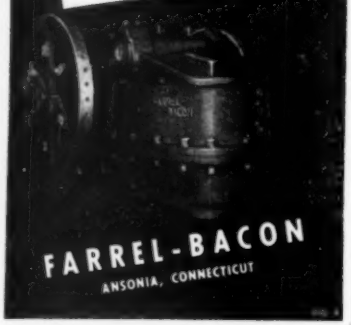
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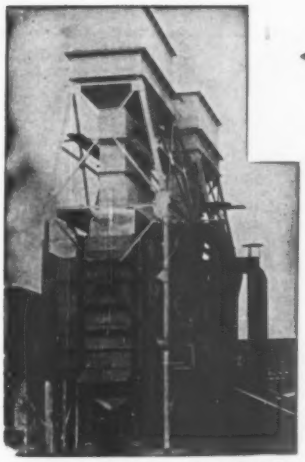
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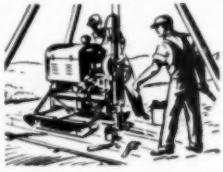
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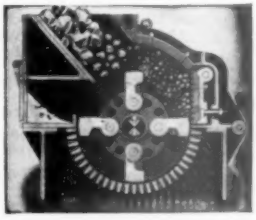


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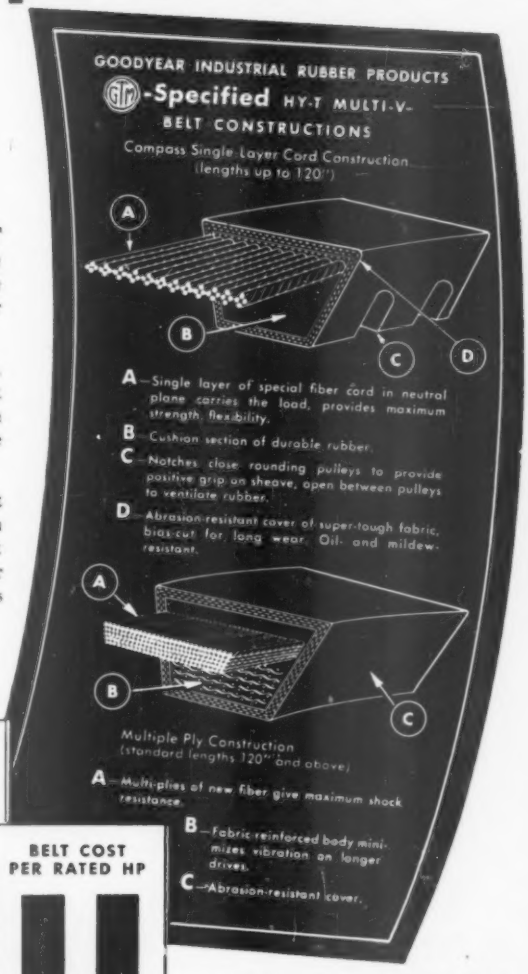
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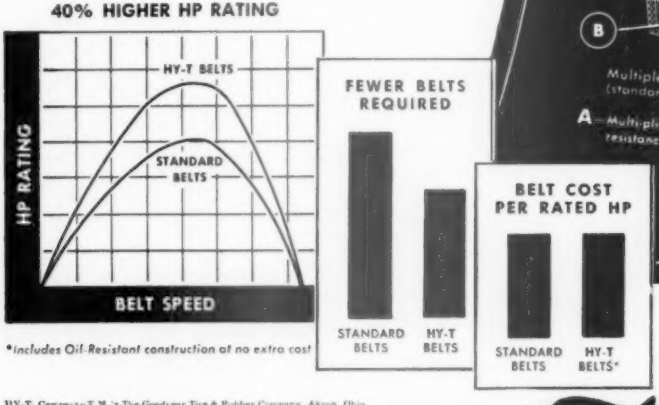
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